WO52 EORS Release 6 Phase 2 Detailed Design

Contract SHA-06-CHART
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Change Log

Revision	Description	Pages Affected	Date
0	Initial Release	All	02/12/2016

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1 Introduction

1.1   Purpose

This document describes the high level design of the software for WO52 EORS Release 6 Phase 2:

- **Implement Event Shop Report Locking**

WO52 EORS Release 6 Phase 2 will implement an event shop report locking mechanism. Events that have been closed for a specified period of time will become locked for event shop reports for all users that are not OOM Administrators or Site Administrators and users in the SOC role. The time period for locking will be configured in the web.config file for EORS. The value stored in web.config will be the number of hours that must pass after the event is closed before the event locks.

When event shop reports are locked non-OOM/Site Administrators and non-SOC may search and view shop reports for the locked events but they may not add or alter them. A message will be displayed on the shop report page indicating that the event is locked. Also, locked events that are returned from searches on the Search Events and Event Admin pages will be flagged in the GUI with a lock icon.

- **Implement Shop Materials Reporting Locking**

WO52 Release 6 Phase 2 will implement a locking mechanism for event materials usage reporting. Events that have been closed for a specified period of time will become locked for materials reporting by all users except OOM and Site Administrators and users in the SOC role. The time period required for materials locking will be configured in the web.config file. The value stored in web.config will be the number of hours that must pass after the event is closed before locking occurs.

When shop materials usage reporting is locked users that are not in the Site Administrator, OOM Administrator and SOC roles will be able to view materials usage reports but they will not be able to add or alter them. A message will be displayed on the materials page indicating that the event is locked. Also, events that are returned from searches on the Search and Event Admin pages where materials usage reporting is locked will be flagged in the GUI with a lock icon.

- **Implement Shop Debris Reporting Locking**
- WO52 Release 6 Phase 2 will implement a locking mechanism for event debris removal reporting. Events that have been closed for a specified period of time will become locked for debris removal reporting by all users except OOM and Site Administrators and users in the SOC role. The time period required for debris removal locking will be configured in the web.config file. The value stored in web.config will be the number of hours that must pass after the event is closed before locking occurs.

When shop debris removal reporting is locked users that are not in the Site Administrator, OOM Administrator and SOC roles will be able to view debris removal

reports but they will not be able to add or alter them. A message will be displayed on the debris removal page indicating that the event is locked. Also, events that are returned from searches on the Search and Event Admin pages where debris removal reporting is locked will be flagged in the GUI with a lock icon.

1.2   Objectives

The main objective of this detailed design document is to provide software developers with a framework in which to implement the requirements identified in the WO52 EORS Release 6 Phase 2 Requirements document.

1.3   Scope

This design is limited to WO52 EORS Release 6 Phase 2 updates.

1.4   Design Process

This design is based on a series of Joint Application Design (JAD) sessions that were held with developers and the SHA EORS Project Manager. The user interface design is included in this document in the Human Machine Interface section. User stories will be the basis for detailed design.

1.5   Design Tools

The use case diagrams, database diagrams, sequence diagrams and state diagrams will be extracted from Visio, CSC Docs portal and the Confluence project portal.

1.6   Work Products

This design document includes the following work products:

- Architecture diagram, showing the high level architecture of components related to this project.
- Human-Machine Interface section which provides descriptions of the screens that are changing or being added in order to allow the user to perform the described uses.

2 Architecture

The sections below discuss specific elements of the architecture and software components that are used in WO52 EORS Release 6 Phase 2.
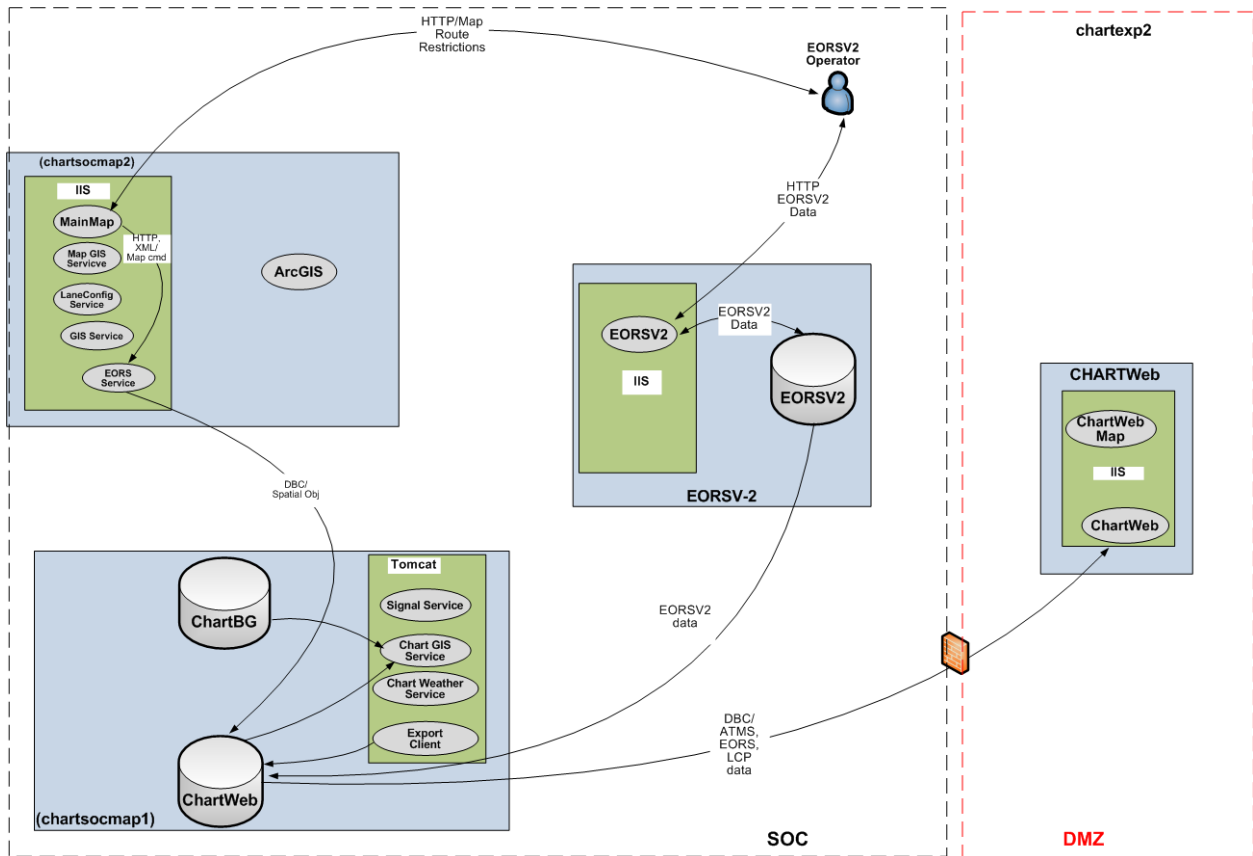
Figure 2-1 EORS Architecture Diagram

2.1 Network/Hardware

2.1.1 EORS

The WO52 EORS Release 6 Phase 2 release will not require that a new server be added to the MDOT network.

2.2 Software

2.2.1 EORS

WO52 EORS Release 6 Phase 2 will use the Microsoft .NET Framework and ASP.NET architecture with the DotNetNuke DNN framework for web application development.

2.2.2 COTS Products

Product Name	Version	Description/Purpose	redistributable	Usage
Microsoft SQL Server	2008 R2	EORSV2 uses Microsoft SQL Server 2008 to host its databases.	Proprietary	Runtime
Microsoft Visual Studio (including .NET 4.5)	2013 Ultimate	EORSV2 uses Microsoft Visual Studio 2012 Ultimate for C# source code development. Necessary library files are used in the runtime environment.	Proprietary	Development Runtime
Microsoft Windows	2008 Server	EORSV2 uses Microsoft Windows 2008 Server as its standard runtime platform for the EORSV2 application/database servers.	Proprietary	Runtime
RedGate SQL Backup Pro	6	EORSV2 uses these parts of the RedGate DBA Bundle monitoring tools to support the backup and restore processes and to monitor database performance	Proprietary	Runtime
RedGate SQL Monitor	2.3.0			
DotNetNuke	7.1	EORSV2 uses the DotNetNuke application framework.	Open source	Development
Subversion	1.6	EORSV2 uses Apache Subversion for source code control.	Open source	Development
Subversion browser TortoiseSVN	1.6.15	Official EORSV2 builds use TortoiseSVN subversion browser. Some developers may use TortoiseSVN as well.	Open source	Development

Product Name	Version	Description/Purpose	redistributable	Usage
vRanger Backup & Replication	5.3.1	The CHART Program uses vRanger Backup & Replication by Quest Software to maintain system backups. This subsystem is not part of the EORSV2 per se, but serves in a support role. Therefore it is listed as having Administrative usage, rather than Runtime usage.	Proprietary	Administrative

2.3 External Interfaces

Figure 5-1 shows the external interfaces to the EORSV2 application.
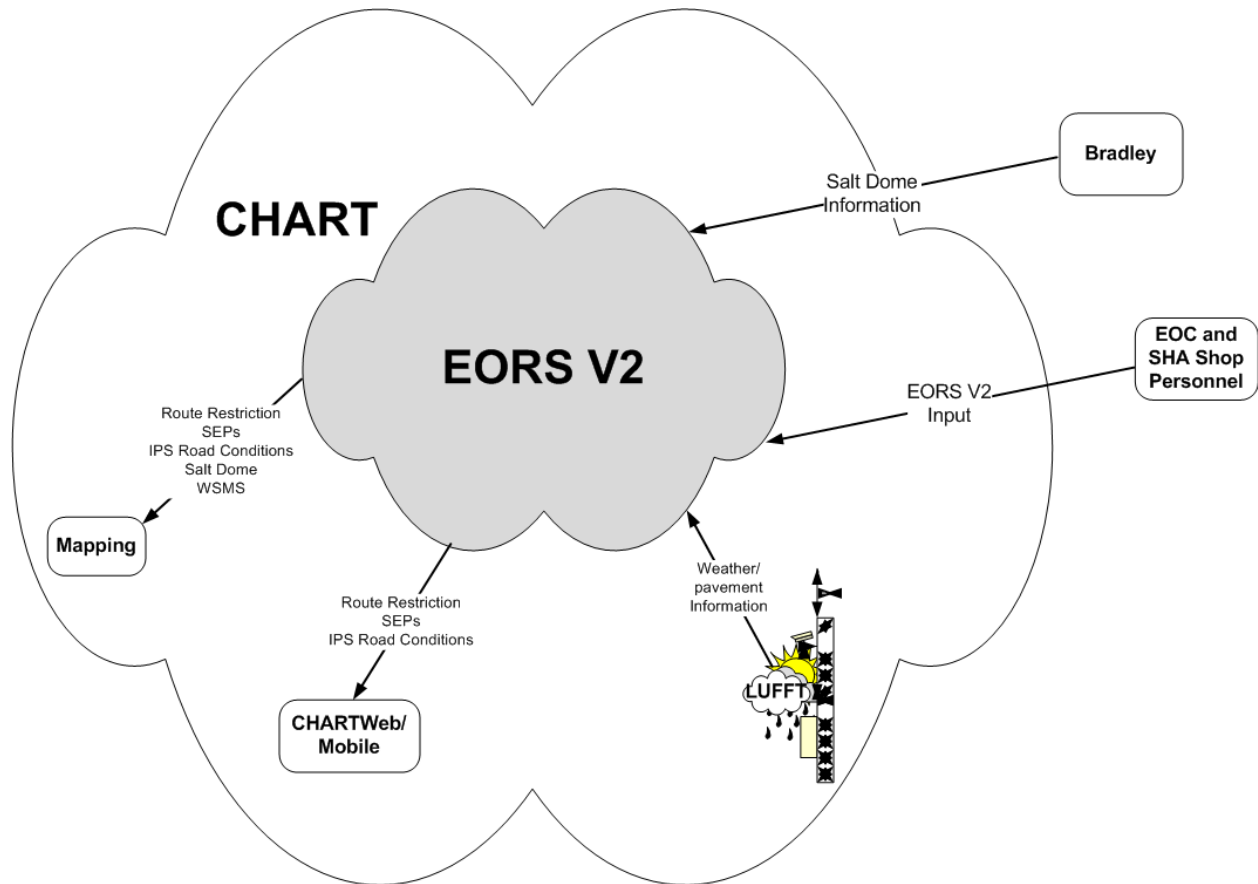
Figure 5-1. EORSV2 External Interfaces

EORS external interfaces consist of:

CHARTWeb – This public-facing site displays EORSV2 Data obtained via the CHARTWeb database.

CHARTWebMobile – This public-facing mobile-friendly site displays EORS Data obtained via the CHARTWeb database.

CHART Mapping – EORS provides data to the CHART Mapping application via the CHARTWeb database.

2.4 EORS Security

2.4.1 No New Roles

WO52 EORS Release 6 Phase 2 will add no new roles.

3 Key Design Concepts

3.1 Event Shop Reports Class Diagram

The following class diagram shows the classes required for creating events in EORS. The classes shown only include those that are affected by WO 52 EORS Phase 2. The diagram depicts the classes used to list and search events as well as materials and debris reporting.
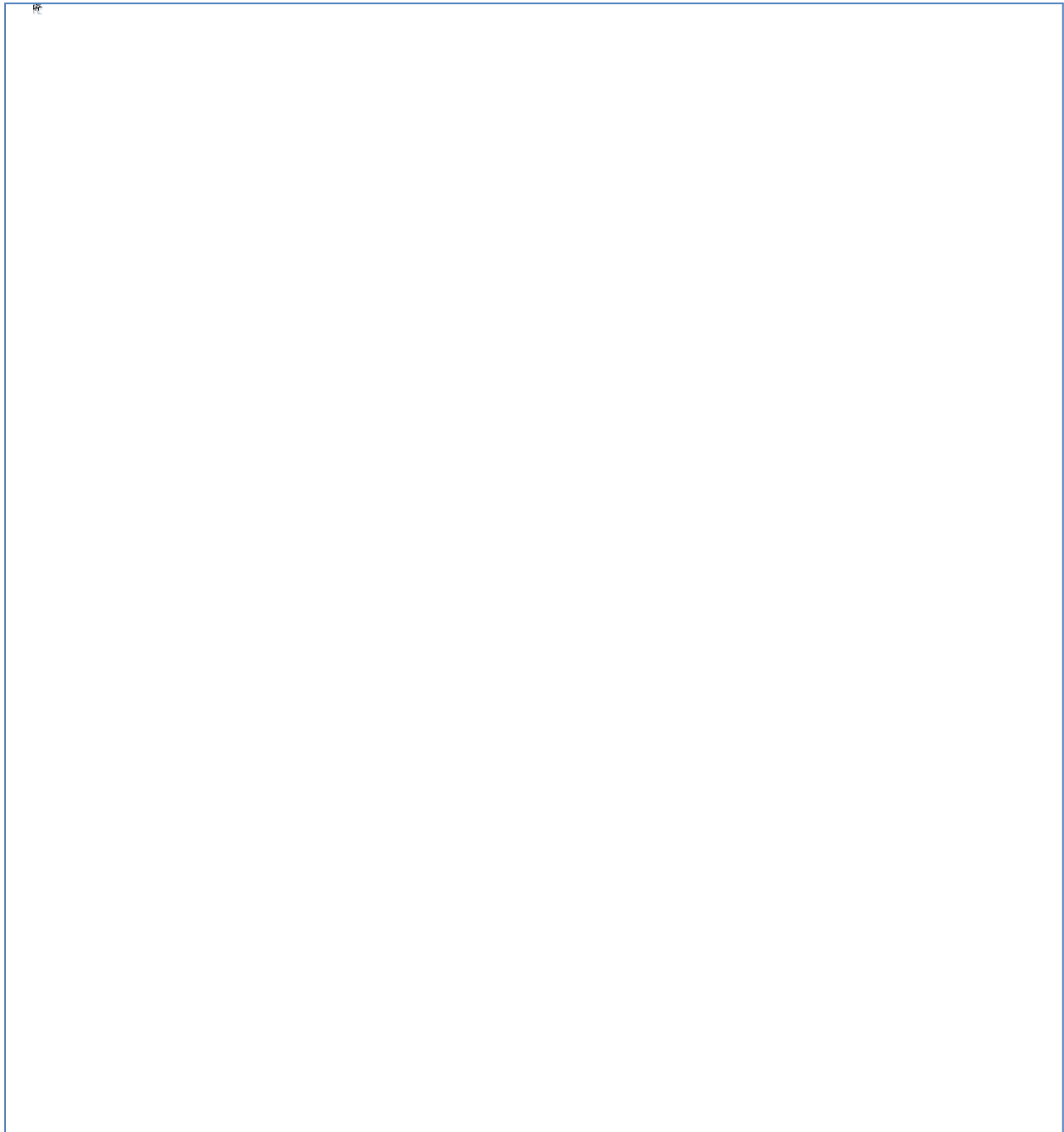
Figure 3-1 Events Class Diagram - CD

The following diagram depicts the classes required for Event Shop Reports. The diagram only includes classes affected by WO 52 EORS Phase 2 work. The classes that do not display attributes or methods are shown for information purposes only. They will be unaltered under this work order. The SqlDataProvider class is the same as in the previous diagram (3-1 Events Class Diagram). It is shown collapsed here to save space.
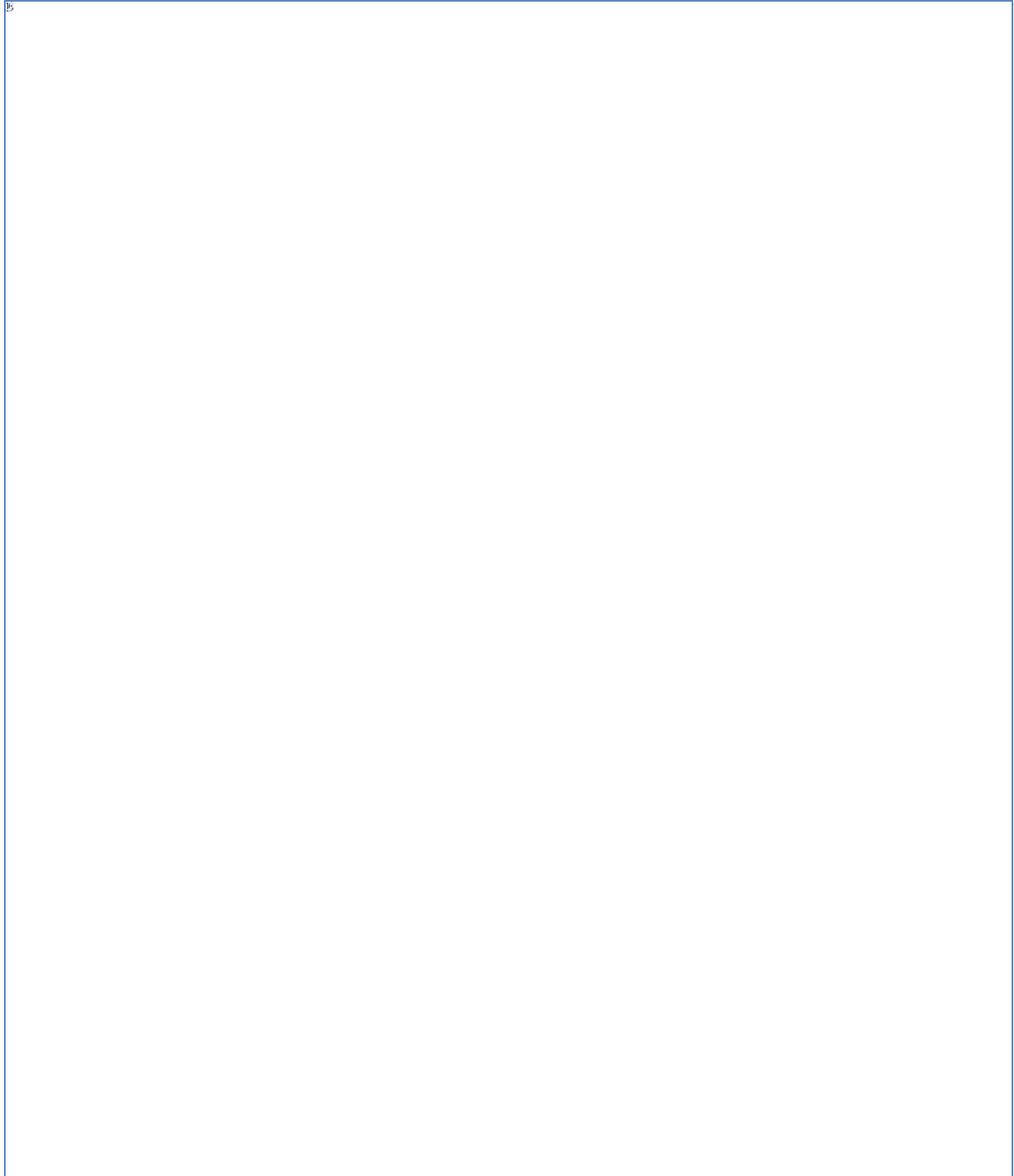
Figure 3-2 Event Shop Reports Class Diagram - CD

3.2 Event Shop Reports Locking

Prior to WO52 Phase 2 closed events in EORS may be updated by any user with access privileges. Phase 2 includes code updates and updates to the web.config file that will cause EORS events to become locked for input for all users except those in the Site Administrator, OOM Administrator and SOC roles.

Events must be closed before they are eligible for locking. After the lockout time has passed event shop reports may only be edited by users in the Site Administrator, OOM Administrator and SOC roles. Other users (i.e. Event Shop Reports role) may search and view shop reports but they will not be able to alter them.

The WO52 Phase 2 code updates include multiple checks against the locked status of EORS events.

- **Search Events**. Each event returned as a result of activity on the Search Events page will be checked to determine if it is locked. If it has been closed longer than the lockout time it will be flagged in the search result list with a lock icon. The event will still be accessible to all users with access privileges.

- **Event Admin**. Each event returned as a result of search activity on the Event Admin page will be checked to determine if it is locked. If it has been closed longer than the lockout time it will be flagged in the search result list with a lock icon. The event will still be accessible to all users with access privileges.

- **List of Shops Reporting**. When the user clicks on the event or report link on the Active Events, Search Events or Event Admin list they are landed on the List of Shops Reporting page. Each of the shops listed has a link to the Event Shop Reports page. If the event is locked each of the shop links will be flagged with a lock icon. The event will still be accessible to all users with access privileges.

- **Event Shop Reports**. The Event Shops Reports page will contain a message at the top of the module container indicating that the event is locked when that is the case. If the event is not locked, no messages will be displayed. If the event is locked users in the Site Administrator, OOM Administrator and SOC roles will have full CRUD access to shops reports for all shops. Other users with access permission will be able to search and view shop reports but all form fields and the Save button will be disabled.

3.2.1 Search Events Sequence Diagram

The diagram below shows the basic sequence of events and interactions between EORS components when a user performs an event search. Event searches begin on the Add /Update Event page in EORS where the user may access the Search Events page. The Search Events page contains a set of input fields representing the search criteria. When the user submits the form EORS searches the database for matching events. All matching events are displayed to the user in a tabular format. Each row in the table represents a distinct event. Each row in the table contains the following fields:

- Event ID

- Event Type
- Active
- Created By
- Date Created
- Last Report
- Event Name
- Report link
- Materials link
- Edit link (administrative users only)
- Admin link (administrative users only)

As of WO 52 Phase 2, events that have been closed will become locked for shop reporting, materials reporting and debris removal reporting (non-winter events only) after their lockout times have expired. Lockout times for shop reports, materials and debris are set separately in the web.config file. When data are returned from an event search each events will be checked against the lockout times. If shop reporting is locked the Event ID link and the Report link will be augmented with a lock icon. If material reporting is locked for the event, the Materials link will be augmented with a lock icon. Likewise, if the event is locked for debris removal reporting, the Debris link will be augmented with a lock icon.

The lock icons on the on the Search Events page are for informational purposes only. The presence of lock icons on the page does not affect any functionality on the Search Events page.

Figure 3-3 Search Events - SD

3.2.2 Events Admin Sequence Diagram

The diagram below shows the basic sequence of events and interactions between EORS components when a user performs an event search on the Event Admin page. Administrative users may access the Event Admin page by clicking the Event Admin button on the Add/Update Event page. The Event Admin page contains a set of input fields representing the search criteria. When the user submits the form EORS searches the database for matching events. All matching events are displayed to the user in a tabular format. Each row in the table represents a distinct event. Each row in the table contains the following fields:

- Event ID
- Event Type
- Active
- Created By
- Date Created
- Last Report
- Event Name
- Select as Source (for moving shop reports between events)
- Select as Destination (for moving shop reports between events)
- Delete link (events may not be deleted if they have shop reports)

As of WO 52 Phase 2, events that have been closed will become locked for shop reporting, materials reporting and debris removal reporting (non-winter events only) after their lockout time has expired. Lockout times for shop reports, materials and debris are set separately in the web.config file. When data are returned from an event search on the Event Admin page, each event will be checked against the lockout times. If shop reporting is locked the Event ID will be augmented with a lock icon.

The lock icons on the on the Event Admin page are for informational purposes only. The presence of lock icons on the page does not affect any functionality on the page.
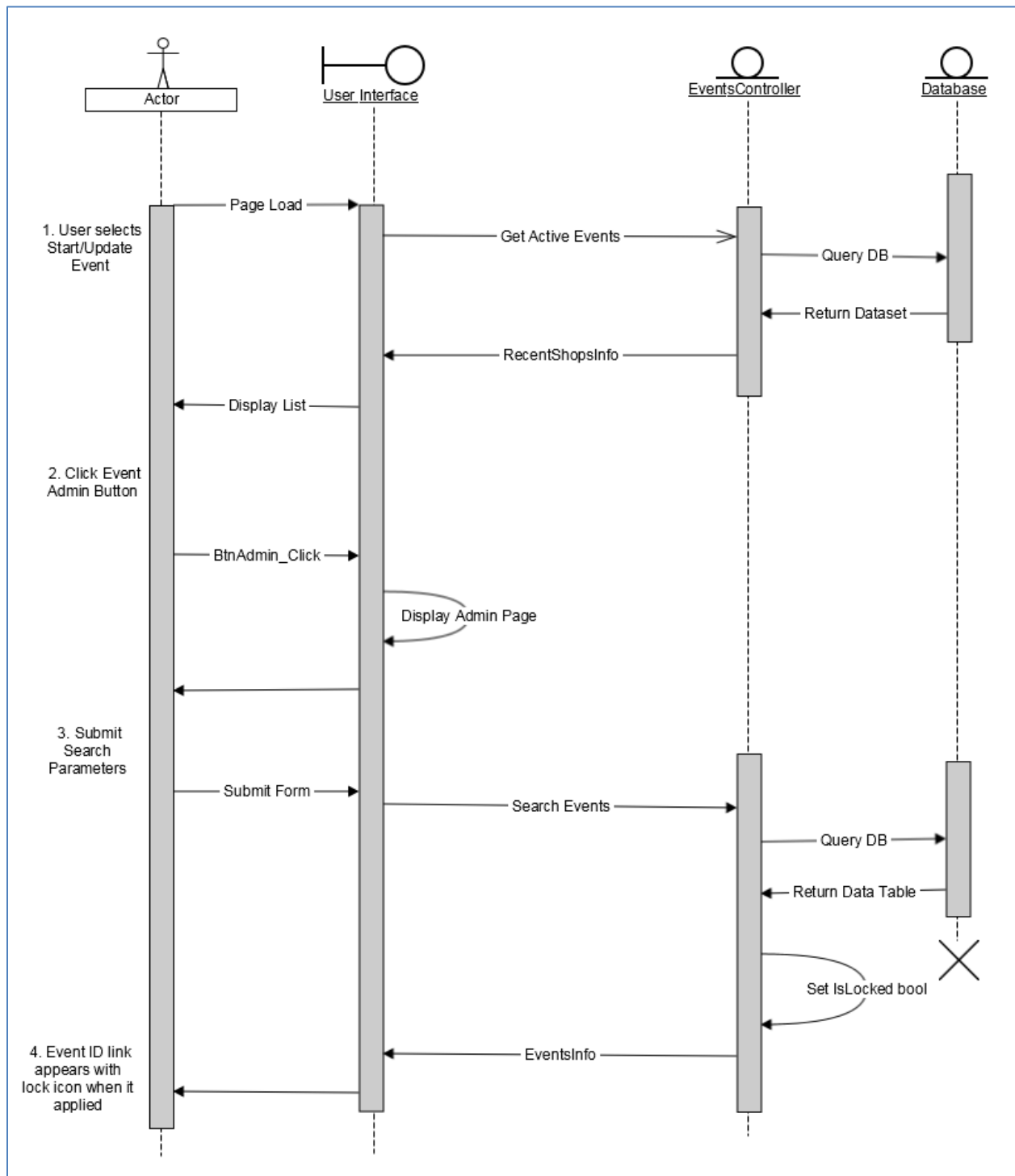
Figure 3-4 Event Admin - SD

3.2.3 List of Shops Reporting Sequence Diagram

The diagram below shows the basic sequence of events and interactions between EORS components when a user clicks on either the Event ID link or the Report link on the Search

Events page or the Event Admin page. When the user clicks one of the links described, EORS loads the List of Shops Reporting page for the event selected. All shops that have reported on the event will be included in the list. Each row in the table represents a distinct shop. Each row in the table contains the following fields:

- Shop name & number
- Last report number
- Last operations type reported
- Date and time of last report
- Link to Latest Shop Detail Report
- Link to other shop detail reports

As of WO 52 Phase 2, events that have been closed will become locked for shop reporting after their lockout time has expired. The lockout time for shop reports is set in the web.config file. When an event is locked each shop link will be augmented with a lock icon.

The lock icons on the on the List of Shops Reporting page are for informational purposes only. The presence of lock icons on the page does not affect any functionality on the page.

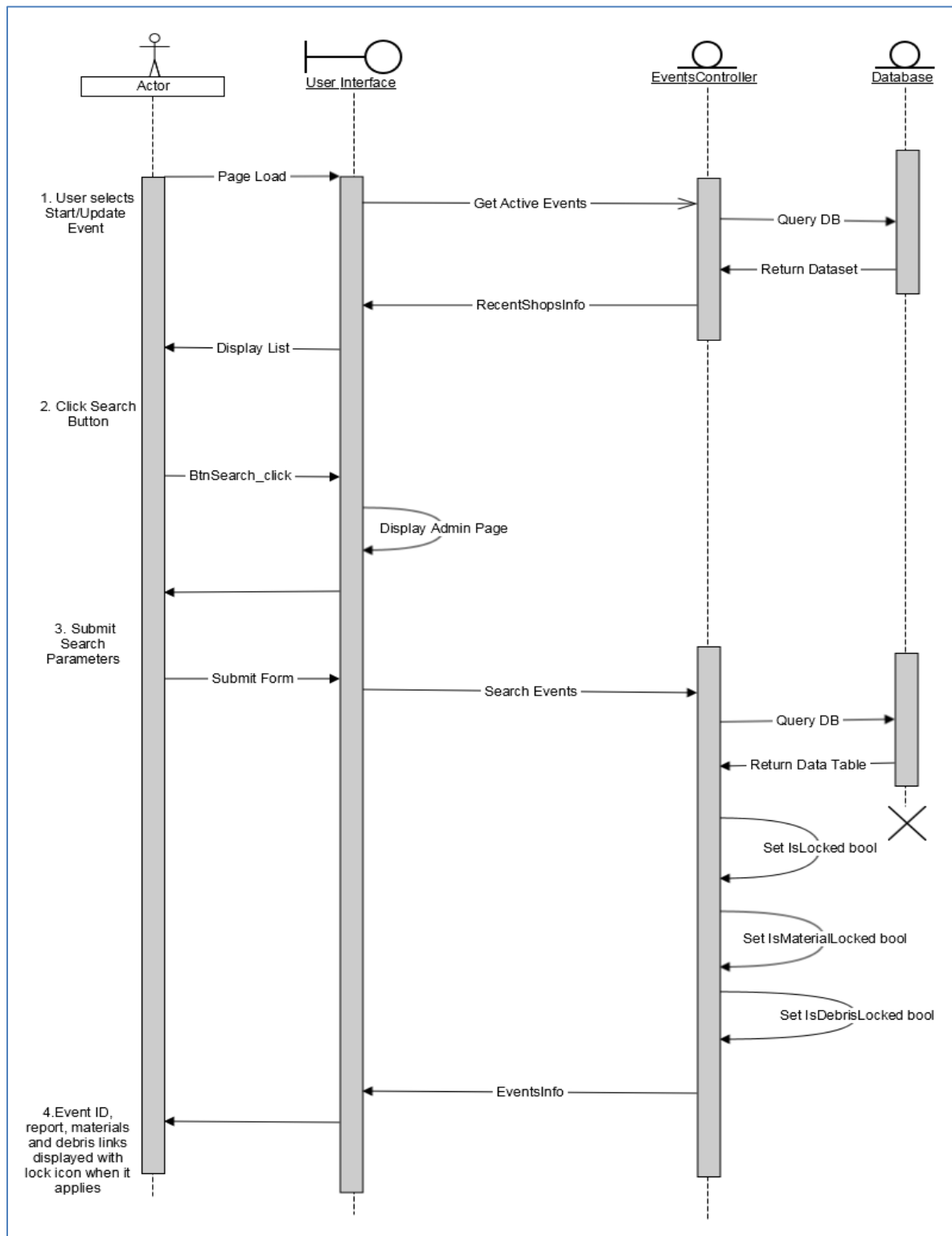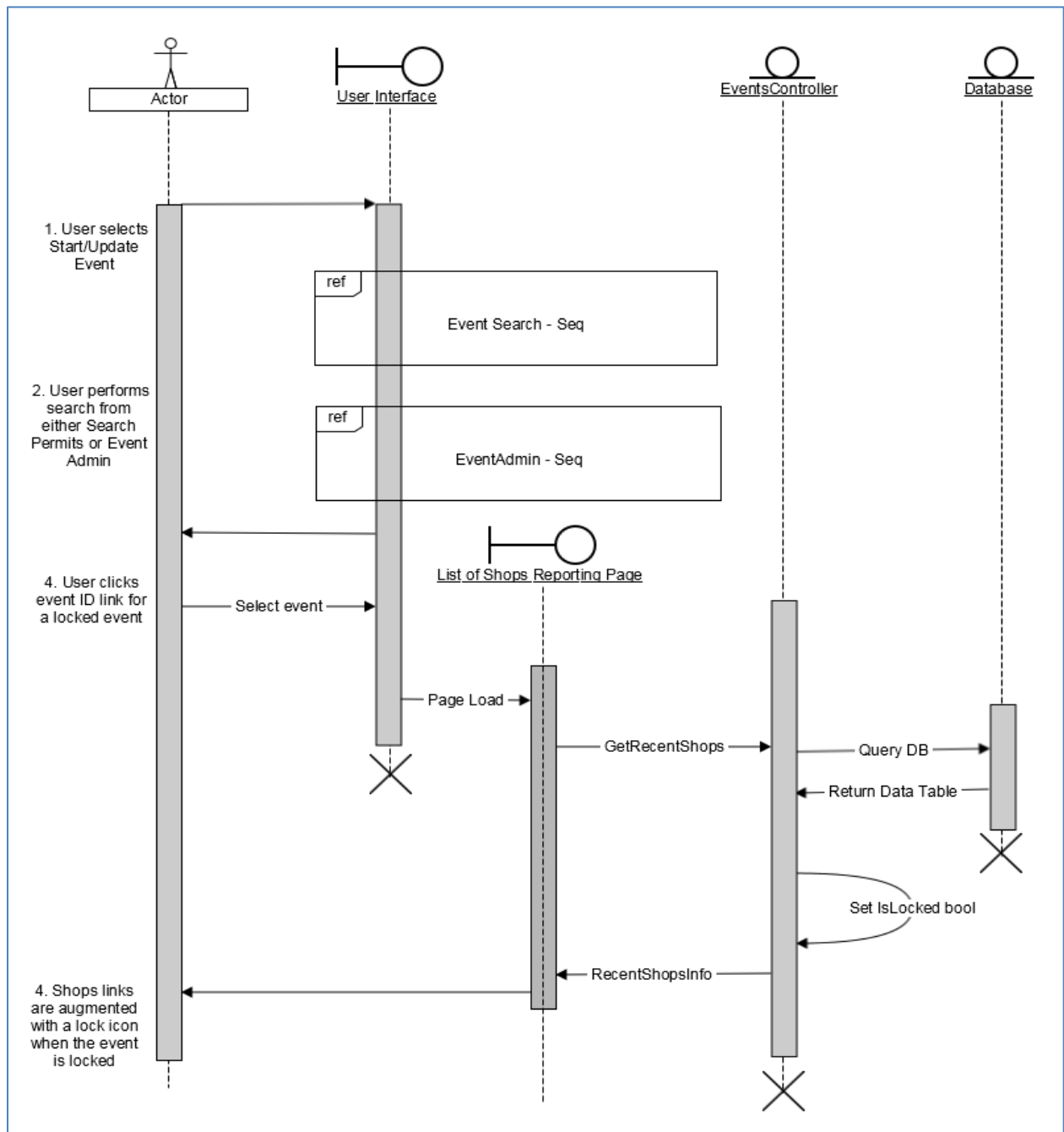**Figure 3-5 List of Shops Reporting - SD**

3.2.4 Event Shop Reports – Admin/OOM Users Sequence Diagram

The diagram below shows the basic sequence of events and interactions between EORS components when a user in either the Admin or OOM Admin role loads the event shop reports page. For these users the only difference between a locked and unlocked event is the presence of a message informing the user that the event is locked. All other page functionality is available.
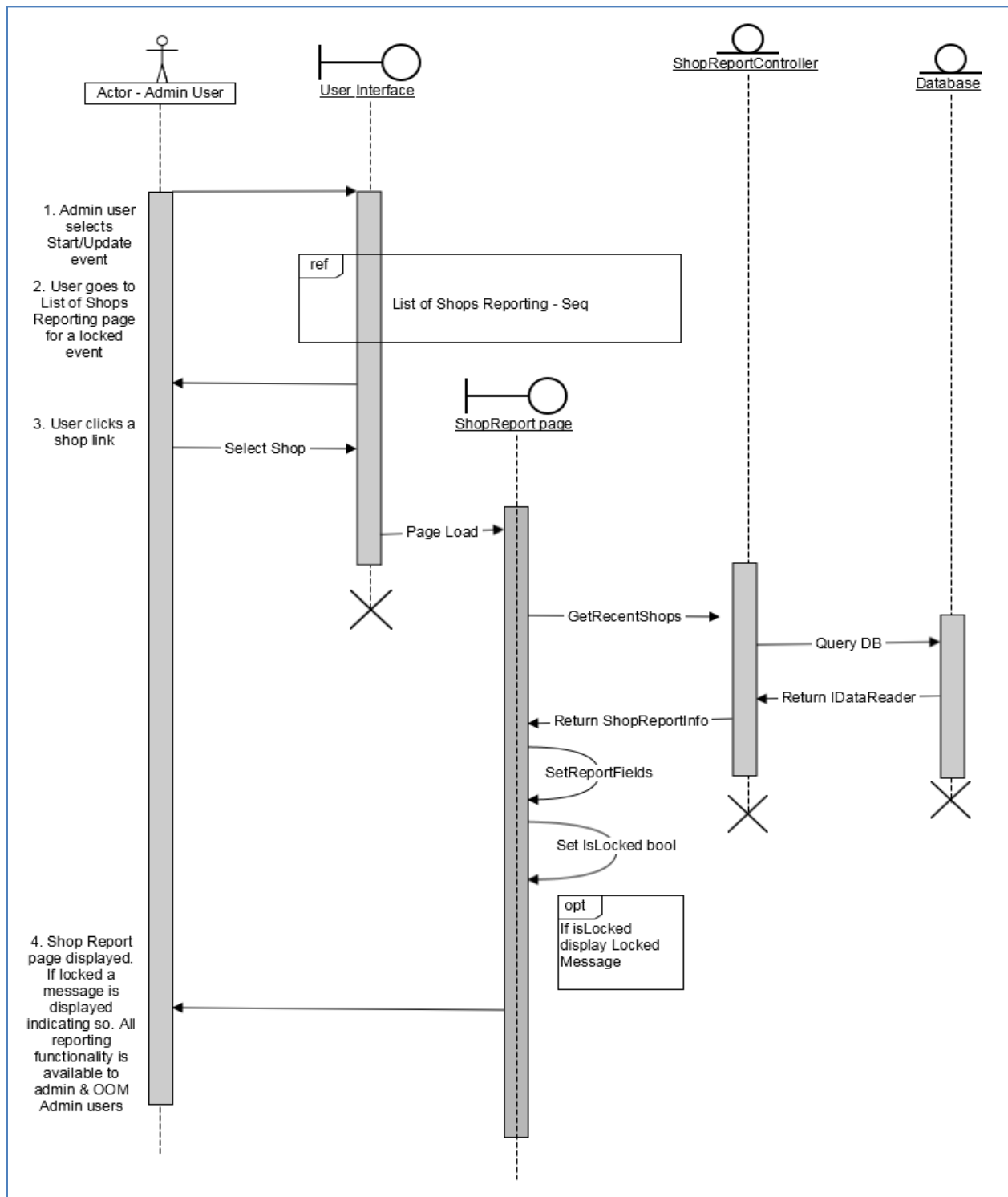
Figure 3-6 Event Shop Reports (Admin/OOM Users) - SD

3.2.5 Event Shop Reports – EventShopReports Users Sequence Diagram

The diagram below shows the basic sequence of events and interactions between EORS components when a non-Administrative user loads the event shop reports page. Non-Administrative users may not add, update or delete shop reports when shop reports are locked. These users may search and view shop reports but input fields will be disabled as will the New Report, Save Report and Delete Report buttons. As was the case with Administrative users, a message indicating the event is locked will be prominently displayed on the page.
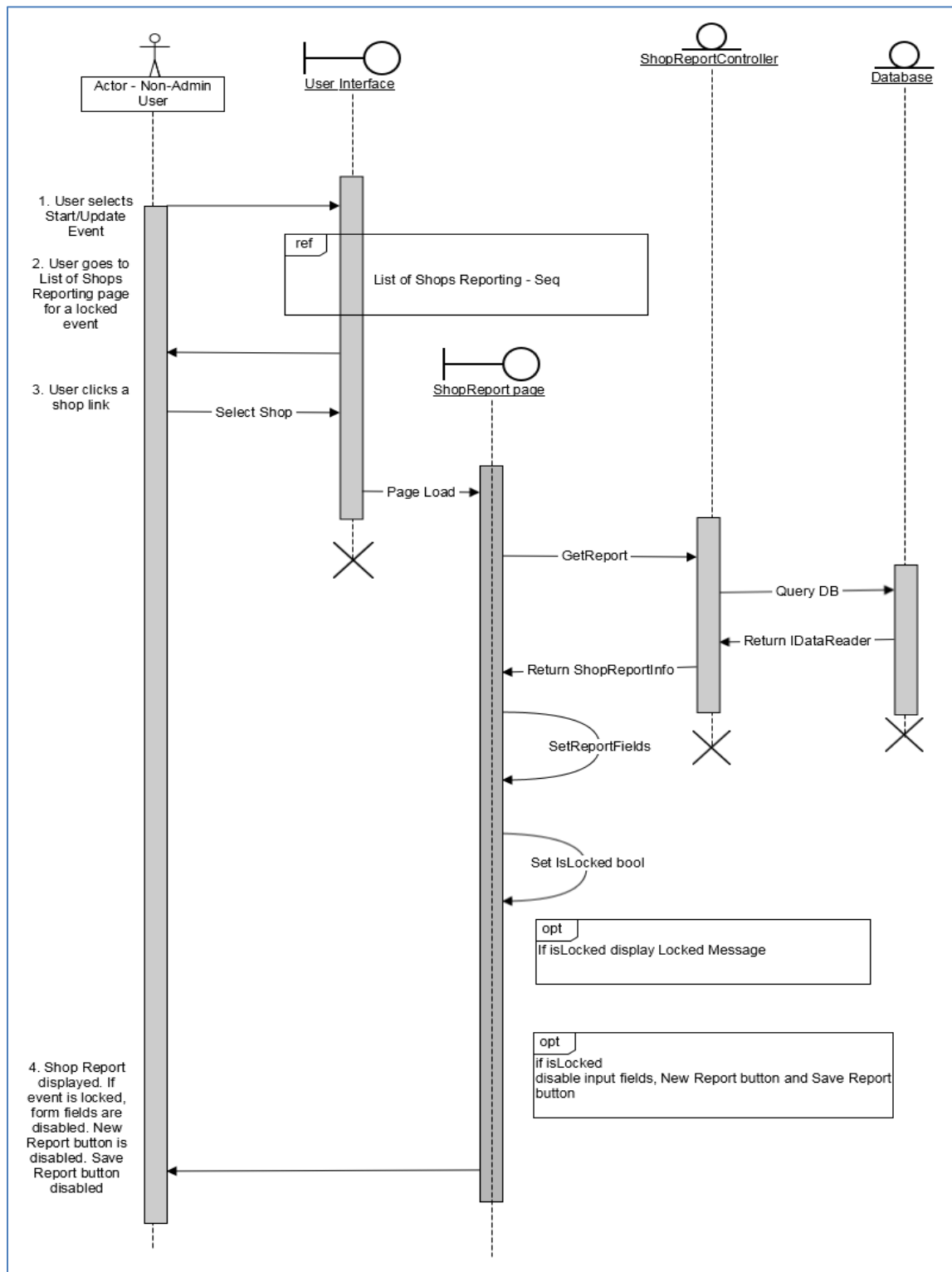
Figure 3-7 Event Shop Reports (EventShopReports/Shop/District Users) – SD

3.3 Event Shop Materials Usage Reporting Locking

The materials section of Events will be locked under these conditions:

- Event is closed (All shops reporting have their operations marked as complete
- The Web.config will have a setting added called MaterialReportLockout that is set to a positive integer (initially 6) signifying the number of hours after an event lockout is supposed to occur
- Assuming the previous 2, user is not an administrator.

What the non-admin user will see is a message at the top of the browser saying that the event is locked and all the fields and buttons grayed out so as to be nonfunctional. Other considerations include having an error message at the top of the screen when either the web.config setting is unavailable or it contains a noninteger value.

3.3.1 Materials Usage Reporting Sequence Diagram

The diagram below shows the basic sequence of events and interactions between EORS components when a user in either the Admin or OOM Admin role loads the event material reporting page. For these users the only difference between a locked and unlocked event is the presence of a message informing the user that the event is locked. All other page functionality is available.
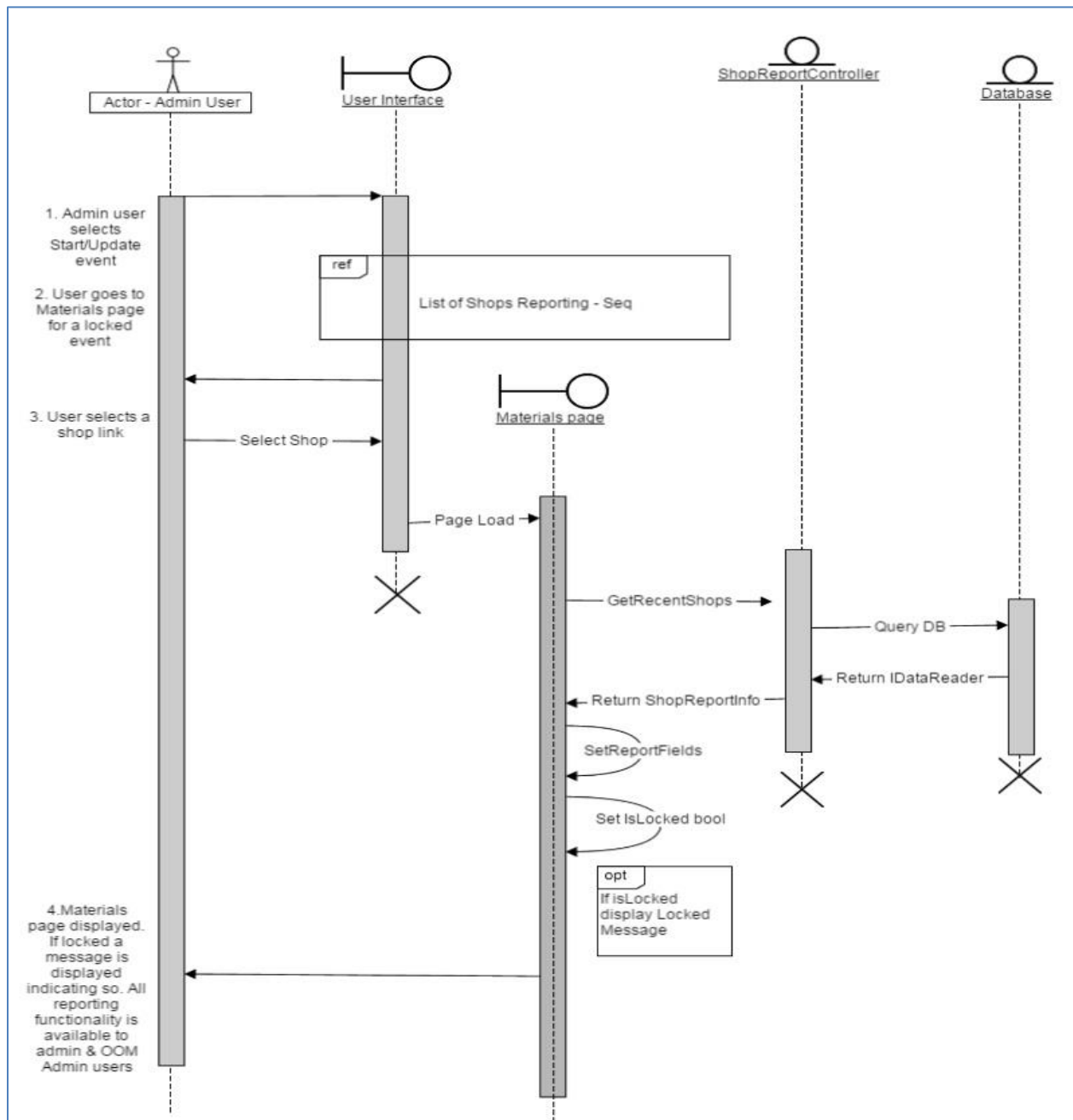
Figure 3-8 Event Materials Reporting (Admin/OOM Users) – SD

The diagram below shows the basic sequence of events and interactions between EORS components when a non-Administrative user loads the event material reporting page. Non-Administrative users will not be permitted to add, update or delete material usage information once the event is locked for material reporting. Users may view data reported but all form fields (except the shop select list) will be disabled. A message indicating that the event is locked will be prominently displayed.
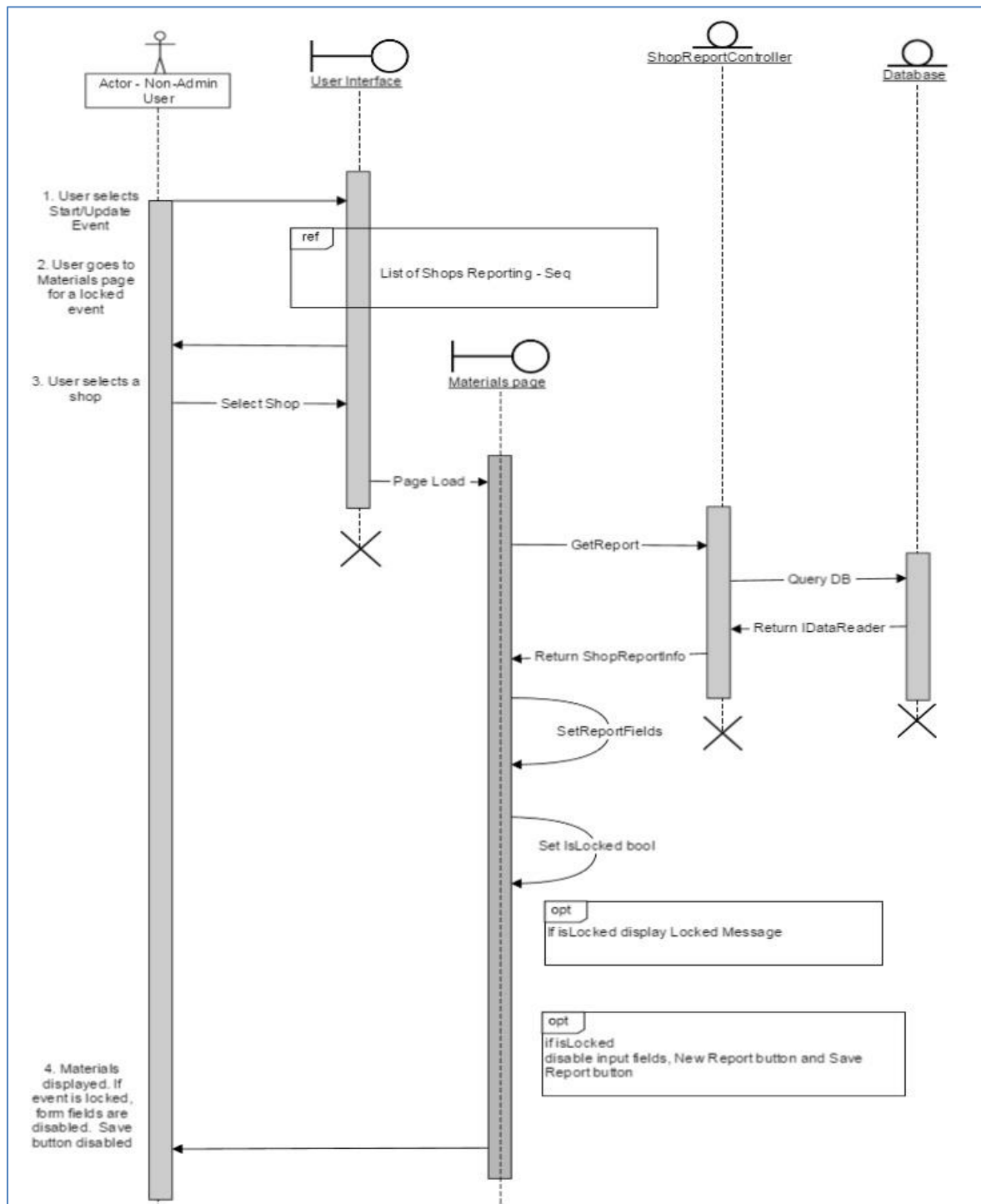
Figure 3-9 Event Materials Reporting (EventShopReports/Shop/District Users) - SD

3.4 Event Debris Removal Locking

The debris section of Events will be locked under these conditions:
-   Event is closed (All shops reporting have their operations marked as complete

- The Web.config will have a setting added called MaterialReportLockout that is set to a positive integer (initially 6) signifying the number of hours after an event lockout is supposed to occur
- Assuming the previous 2, user is not an administrator.

What the non-admin user will see is a message at the top of the browser saying that the event is locked and all the fields and buttons grayed out so as to be nonfunctional. Other considerations include having an error message at the top of the screen when either the web.config setting is unavailable or it contains a noninteger value.

3.4.1 Debris Removal Sequence Diagram

The diagram below shows the basic sequence of events and interactions between EORS components when a user in either the Admin or OOM Admin role loads the event debris removal reporting page. For these users the only difference between a locked and unlocked event is the presence of a message informing the user that the event is locked. All other page functionality is available.
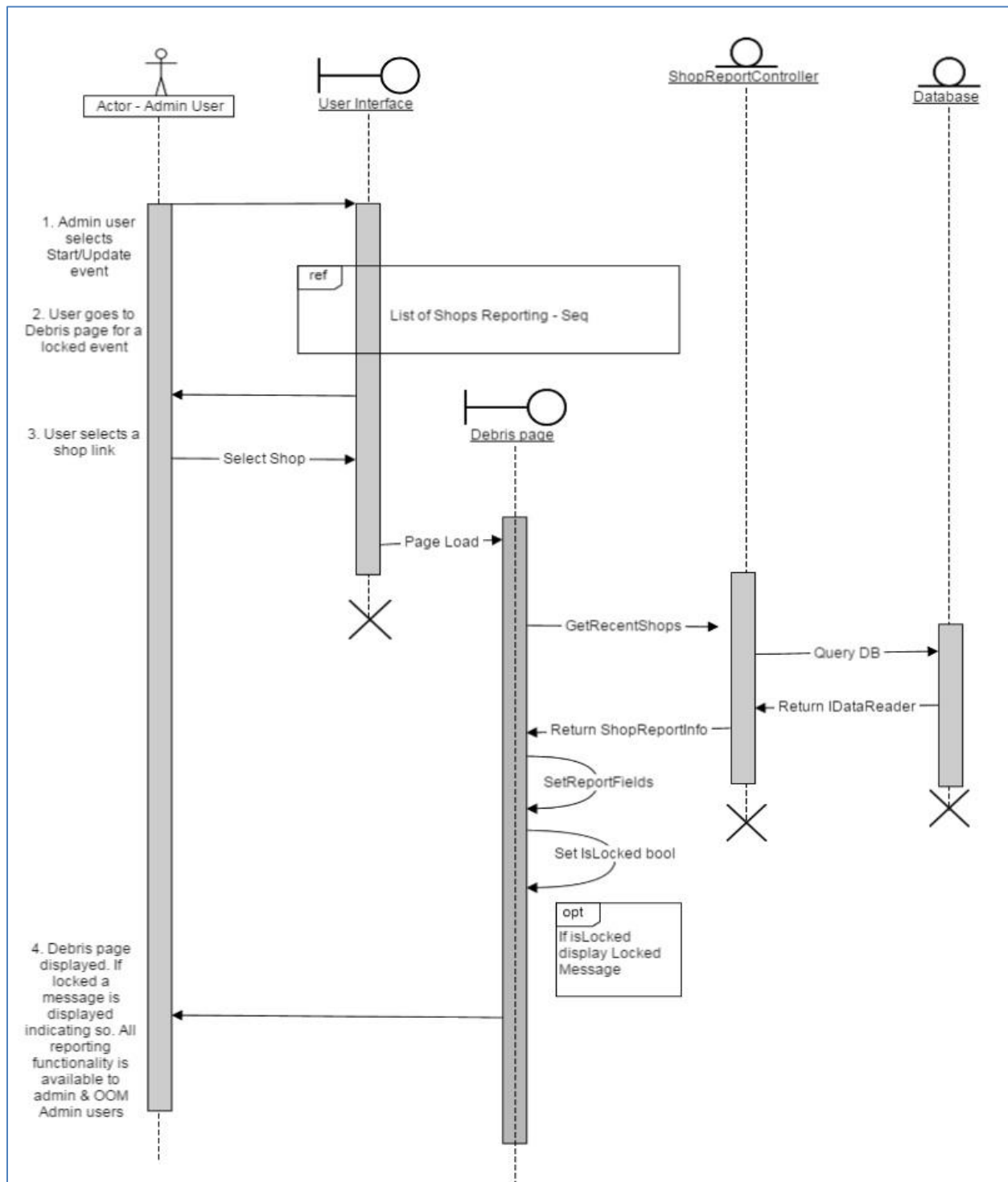
Figure 3-10 Event Debris Removal Reporting (Admin/OOM Users) – SD

The diagram below shows the basic sequence of events and interactions between EORS components when a non-Administrative user loads the event debris removal reporting page. Non-Administrative users will not be permitted to add, update or delete debris removal information once the event is locked for debris reporting. Users may view data reported but all

form fields (except the shop select list) will be disabled. A message indicating that the event is locked will be prominently displayed.
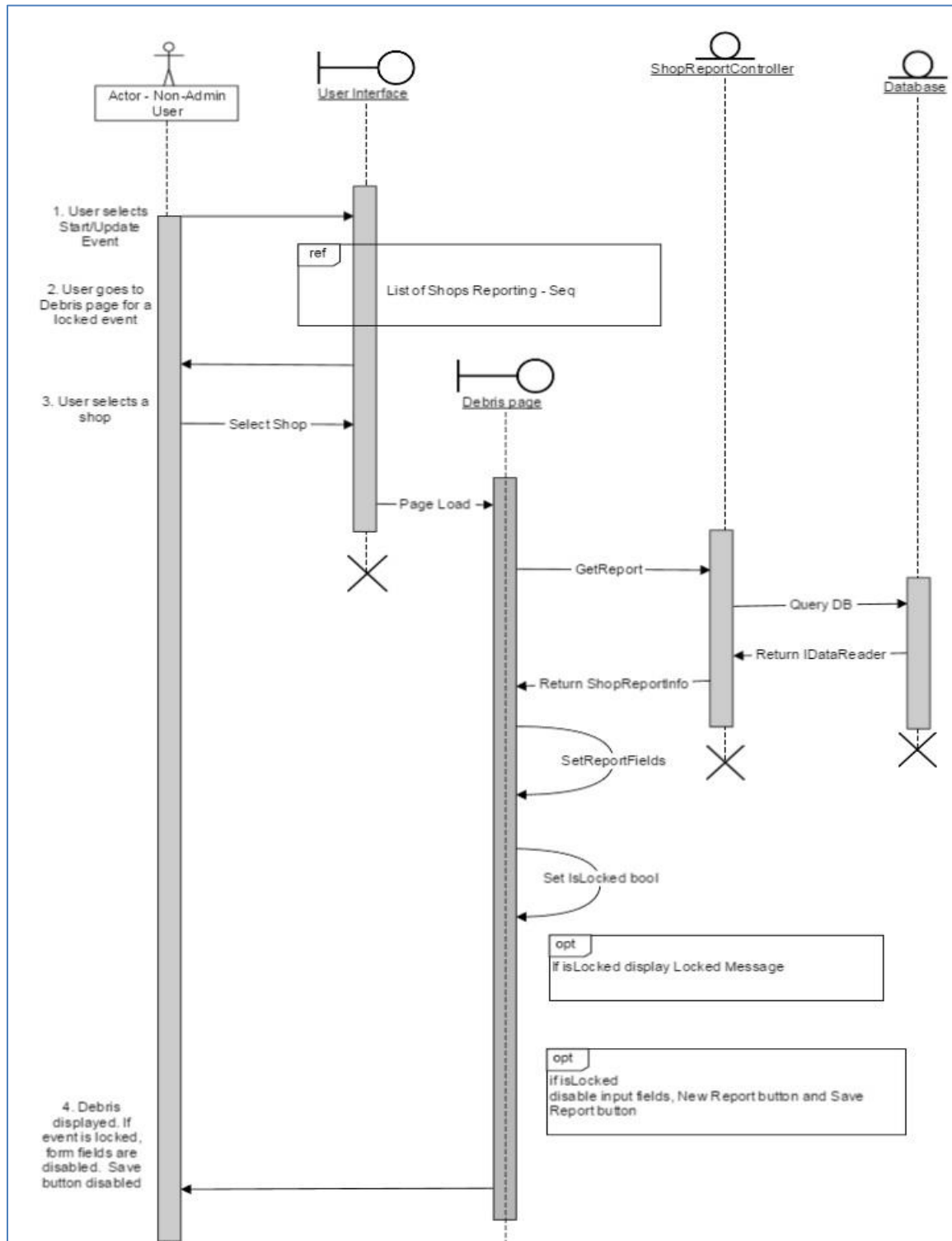
Figure 3-11 Event Debris Removal Reporting (EventShopReport/Shop/District Users) - SD

3.5 Add Ice to Event Shop Reports Weather Tab

Prior to WO52 Phase 2 the EORS shop reports weather tab for winter events contained an input field for users to enter snow accumulation amounts. The Maryland State Highway Administration requested that an additional field be added to the Winter Event Shops Reports page Weather tab so that users may report ice accumulation in addition to snow accumulation. It was also deemed desirable to display the "modified depth" that is used throughout EORS reports as a text label on the Weather tab. Modified depth is calculated as snow depth + 10 * ice depth.

The following diagram depicts the class required for the weather tab on the EORS Event Shop Reports page:
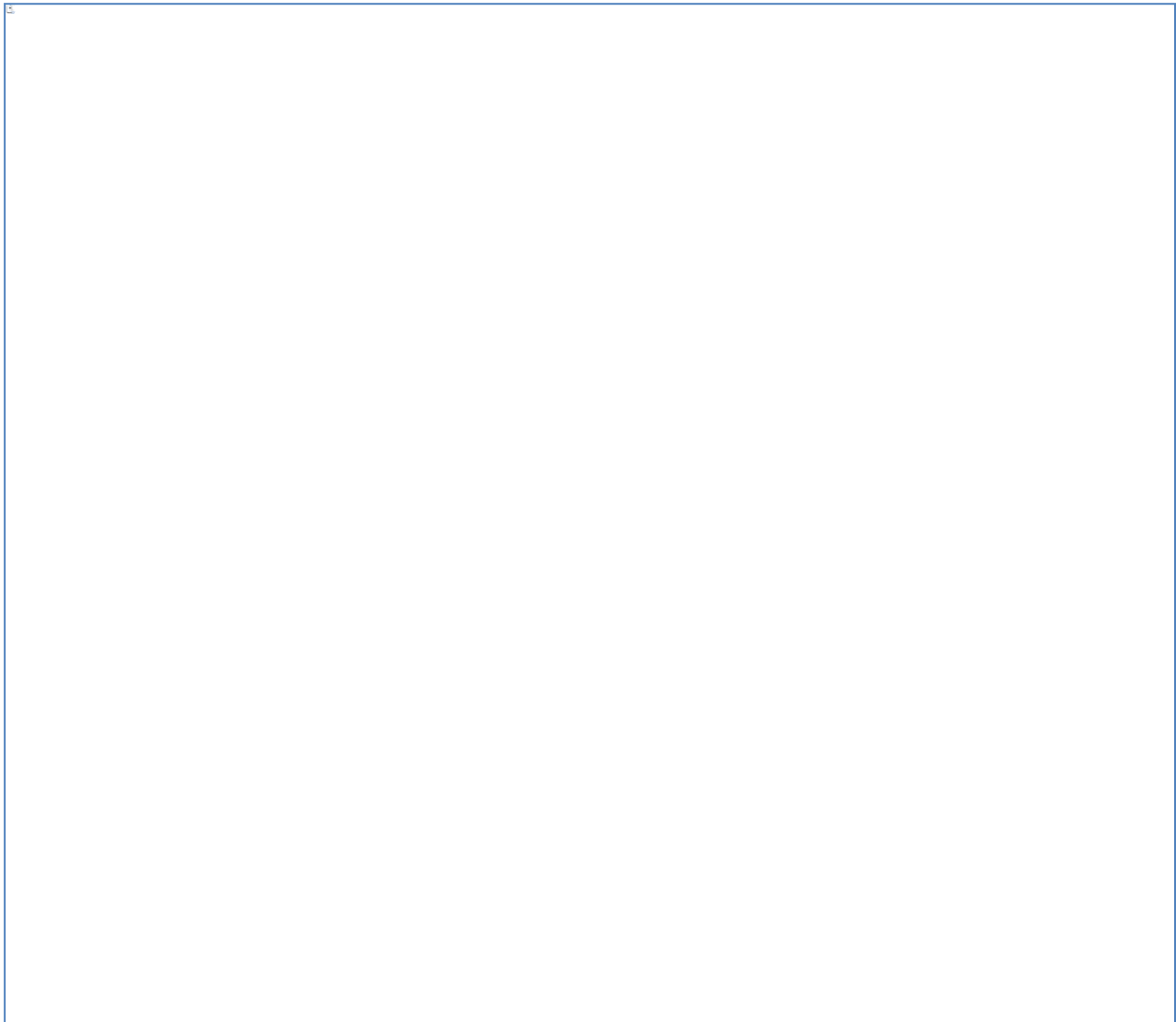
Figure 3-12 Event Shop Reports Weather Tab – CD

3.5.1 Event Shop Reports Winter Event Weather Tab Sequence Diagram

The diagram below shows the basic sequence of events and interactions between EORS components when an EORS user loads the event shop reports page weather tab. WO 52 Phase 2 change requests included a request that an ice/freezing rain text box be added to the winter weather tab on the event shop reports page. It was also deemed desirable to include a label field that will shop the modified depth reported (snow depth + 10 * ice depth) on the page. When the user opens the shop report page EORS will retrieve that last shop report to prepopulate all form fields. If no reports exist for the shop/event, EORS will default form fields to zeros for numeric data and blanks for text data. If snow and ice and been previously reported then EORS will fill the form with those values and calculate the modified depth. When the user adds or alters either the snow or ice text boxes, EORS will dynamically update the modified depth label. When the user saves the shop report EORS will save the snow and ice as separate database fields. The modified depth will not be saved but will be calculated dynamically whenever it is needed.
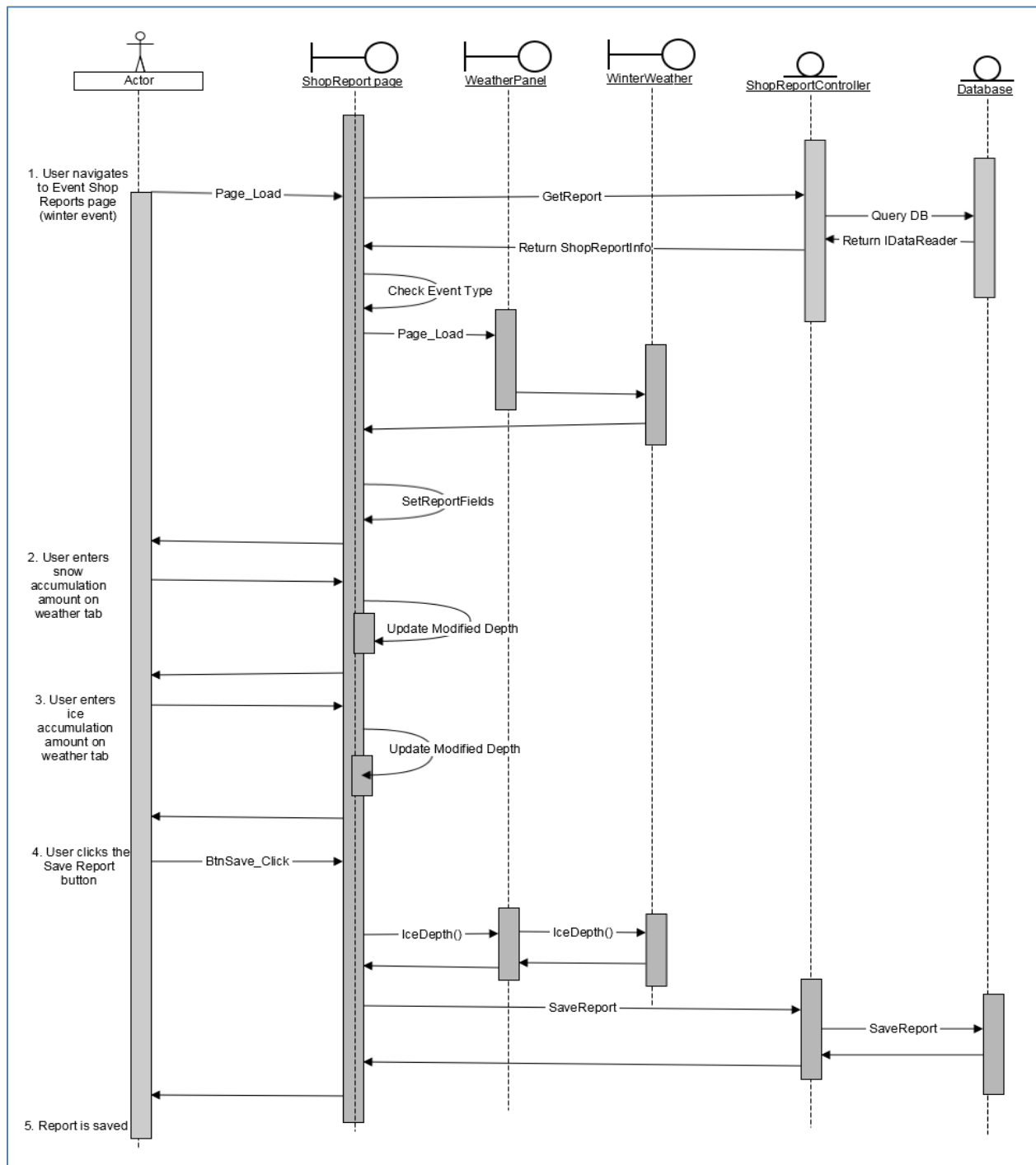
Figure 3-13 Add Ice to Event Shop Reports Weather Tab - SD

3.6 Salt Usage Report

Prior to WO52 EORS Phase 2, the Salt Usage Report displayed the modified depth field in the report. The Maryland State Highway Administration requested that the Salt Usage Report be altered to display snow accumulation, ice accumulation and modified depth in separate columns in the report. The shop, district and statewide averages rows will be updated to include the additional columns.

The goal of the report is to give OOM personnel an overview of shop salt usage in response to winter storm events over a given timespan. The report contains some other summary statistics that will be described in the report fields table below.

There will be two types of Salt Usage Report: The Salt Usage Summary Report and the Salt Usage Details Report. The Salt Usage Summary Report is not affected by WO 52 Phase 2.

The Salt Usage Summary Report will contain a row for each shop in EORS. Each shop row will contain a column for each season in EORS where event shop reports exist. The data for each shop/season combination will be the average pounds of salt per lane mile per inch of snow/ice accumulation over the season. The report will be grouped by district and each district will contain a totals and averages row. The totals row will only contain the total number of lane miles in the district. The averages row will contain the average pounds of salt per lane mile per inch of snow/ice accumulation taken across the district and season. A screen shot of the Salt Usage Summary Report will be included for clarification.

The Salt Usage Details Report will be grouped by district and each shop within the district will appear in one row only. Each district will be summarized with a district averages row and a district totals row. In the event that the report is run for all SHA shops (districts 1 - 7), SHA averages and totals rows will be included. If a report is run for a specific shop or district, SHA totals and averages will not be included. The data for the details report will be taken from the event shop reports using a query embedded in the report.

The table below lists all of the fields that will be displayed in the Salt Usage Details Report. With each field in the table is a description of what the expected value of the field should be and how it is calculated.

Field	Description
Events with Accumulation	This field is a counter of events where the shop reported snow/ice accumulation in the specified time frame
Total Snow Accumulation in Inches	This field is the sum of the maximum snow accumulations reported by the shop in each event
Total Ice Accumulation in Inches	This field is the sum of the maximum ice accumulations reported by the shop in each event
Total Modified Depth	This field is the sum of the modified depths reported by the shop in each event
Tons of Salt Used	This field is the sum of the reported salt usage (in tons) for each event the shop reported on
lbs. per lane Mile	This field is calculated as Tons of Salt Used (previously described) * 2000 / shop lane miles. The total number of lane miles for each shop is stored in the EORSV2 database

Field	Description
Lbs. per Lane Mile Per Inch	This field is calculated as the Lbs. per Lane Mile (previously described) / Total Accumulation in Inches (previously described)
Total Gallons of Liquid Used	This field is the sum of all types of liquid treatment used by the shop over the specified timespan. The types of liquid treatment are: Salt Brine, Salt Brine Enhanced, Magnesium Chloride and Magnesium Chloride Enhanced.
Total Gallons of Liquid Used per Ton of Salt	This field is the Total Gallons of Liquid Used (described above) divided by the Tons of Salt Used (previously described)

The table below lists all of the fields that will be displayed in the Salt Usage Details Report district and SHA totals rows:

Field	Description
Lane Miles	This field will show the total lane miles in the district/SHA
Total Tons of Salt Used	This field will contain the sum of the shop salt usage in tons over the district/SHA
Total Gallons of Liquid Used	This field will contain the sum of all shop liquid treatment in gallons over the district/SHA. The types of liquid treatment are: Salt Brine, Salt Brine Enhanced, Magnesium Chloride and Magnesium Chloride Enhanced.
Total Gallons of Liquid Used per Ton of Salt	This field will contain the sum of liquid used by the shop (described above) divided by the sum of the tons of salt used (described previously).

The table below lists all the fields that will be displayed in the Salt Usage Details Report district and SHA averages rows:

Field	Description
Average Events with Accumulation	The sum of the counts of shop events with accumulation divided by the number of shops (an average of the column above it)
Average Snow Accumulation	The sum of the shop snow accumulations divided by the number of shops (an average of the column above it)
Average Ice Accumulation	The sum of the shop ice accumulations divided by the number of shops (an average of the column above it)
Average Modified Depth	The sum of the shop modified depths divided by the number of shops (an average of the column above it)
Average Lbs. per Lane Mile	The sum of the shop tons of salt used times 2000 divided by the sum of the shop lane miles (Tons * 2000/District (or SHA) Lane Miles)
Average Lbs. per Lane Mile per Inch	The sum of the shop tons of salt used times 2000 divided by the sum of the shop lane miles divided by the sum of the shop accumulations (Tons * 2000 / District (or SHA) Lane Miles / Total Accumulation). If no accumulation was reported this field will default to zero.

Report Parameters

The Salt Usage Report takes multiple parameters. The summary report takes no parameters other than a Boolean indicating that the summary report is to be returned. When this option is selected the "By Event" and "Show Events" checkboxes will be hidden and all other parameter fields will be disabled.

The details report requires that either a season (which will be converted to a date range in the report query) or a specific date range if a partial season is desired. The details report will also accept some drill down parameter options. Reports may be run for SHA Districts 1 - 7 or MDTA but not both at the same time. Reports may also be run for a specific district or shop. Reports may be run for specific events as well. Some of the parameters may be used in combination with others to get different reports. A season or date range may be used in combination with drill down by SHA, MDTA, district or shop to return data for the specified entity only. Also season or date range may be combined with a specific event to return data for all shops (SHA or MDTA) for the specified event only. Lastly, season or date range may be combined with any SHA, MDTA, district, shop drill down together with an event.

By default the Salt Usage Details Report will show one row per shop. However, is the "Show Events" checkbox is selected; the report will display a data row for each event that each shop reported upon over the given time frame.

The table below lists all of the parameters the Salt Usage Details Report will accept. The first column is the parameter name. The second column is a description of the parameter and the third column shows what parameters it may be combined with.

Parameter	Description	Combine With
Season (default)	The season parameter is a string such as 2014-2015. It will be automatically converted to a date range in the report. Each season begins on July 1 and ends June 30. For example the season 2014-2015 will be converted to July 1, 2014 - June 30, 2015. In this case the report will include all events between the converted dates.	SHA, MDTA, By District, By Shop, By Event, Show Events
Date Range	Time pickers may be used to send a specific date range to the report. In this case no conversion needs to take place in the report. The report will include all events between the specified dates.	SHA, MDTA, By District, By Shop, By Event, Show Events
Summary Only	When this option is selected EORS will return the Salt Usage Summary Only Report. No other report parameters will be accepted.	None
SHA Districts 1 - 7 (default)	All shops in Districts 1 - 7 will be included in the report. MDTA will be excluded.	Season, Date Range, BY Event, Show Events
MDTA	All MDTA shops will be included in the report. Districts 1 - 7 will be excluded.	Season, Date Range, BY Event, Show Events
By District	Only the specified district/MDTA will be included in the report	Season, Date Range, BY Event, Show Events
By Shop	Only the specified shop will be included in the report	Season, Date Range, BY Event, Show Events
By Event	Only the specified event will be included in the report	Season, Date Range, SHA, MDTA, By District, By Shop
Show Events	When this option is selected, the report will display a row for each event/shop combination	Season, Date Range, SHA, MDTA, By District, By Shop, By Event

The default parameter set is season and SHA Districts 1 - 7 with By Event and Show Events unchecked.

3.6.1 Salt Usage Report Class Diagram


```
                        «C# class»
           EORS::SaltUsageReport::ViewSaltUsageReport

⊟ Attributes
⊟ Operations
    + ViewSaltUsageReport()
    - SetDateRangeEnabled(isEnabled : Boolean)
    - SetDistrictShopEnabled(isDistEnabled : Boolean, isShopEnabled : Boolean)
    - ValidateDates() : Boolean
    - ValidateDistrict() : Boolean
    - ValidateEndDate() : Boolean
    - ValidateShop() : Boolean
    - ValidateStartDate() : Boolean
    # btnGo_click(sender : Object, e : EventArgs)
    # EndDate_Changed(sender : Object, e : EventArgs)
    # GetEvents(sender : Object, e : EventArgs)
    # GetEvents_Clicked(sender : Object, e : EventArgs)
    # Page_Load(sender : Object, e : EventArgs)
    # rbgDrillDown_change(sender : Object, e : EventArgs)
    # rbgType_change(sender : Object, e : EventArgs)
    # StartDate_Changed(sender : Object, e : EventArgs)
    # ValidDate(sender : Object, value : ServerValidateEventArgs)
```
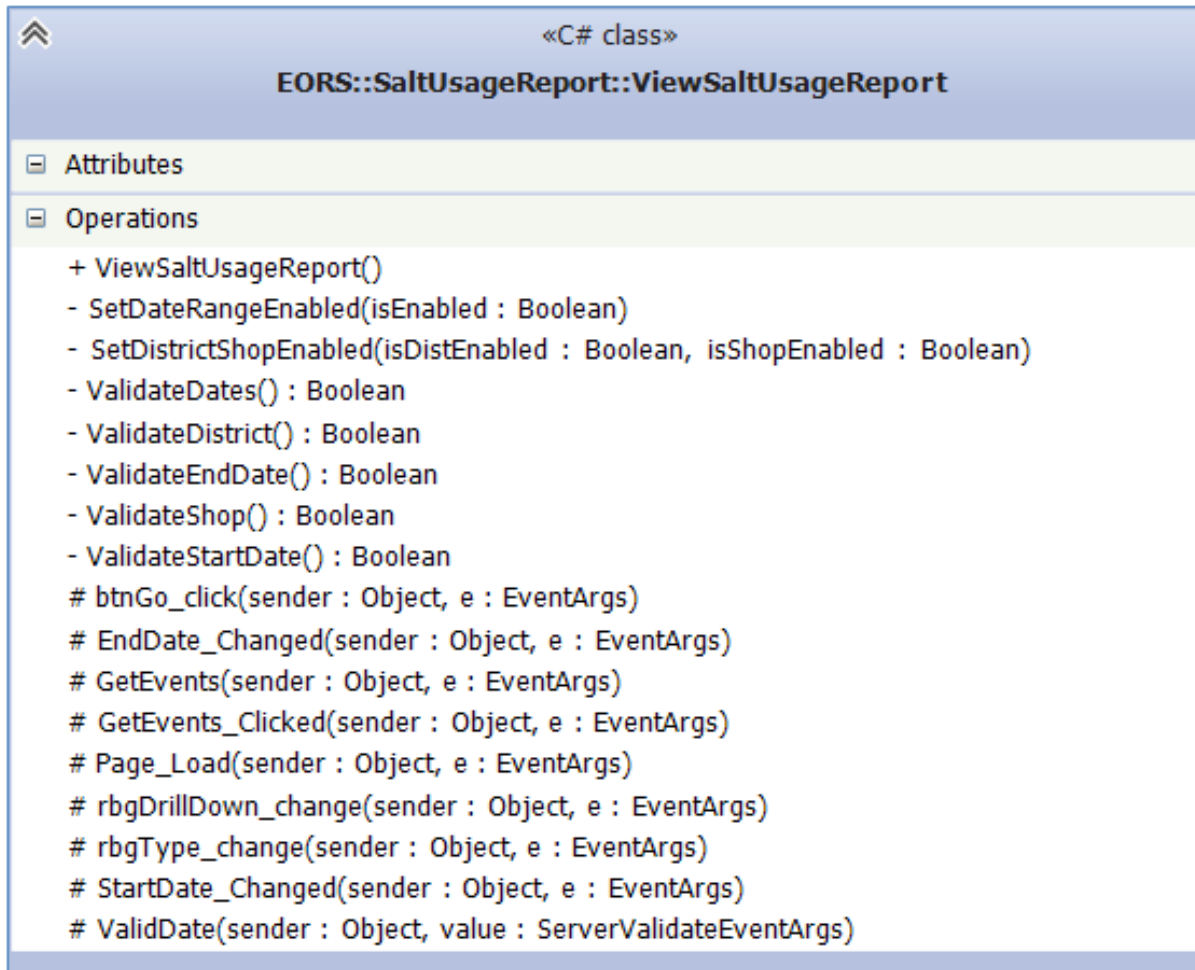
Figure 3-14 Salt Usage Report Class Diagram – CD

3.6.2 Salt Usage Report Sequence Diagram

The diagram below shows the sequence of events and interaction between EORS components when a user runs a Salt Usage Report. To run a Salt Usage Report the user selects

EORS Reports >> Salt Usage Report from the main site menu. EORS will load the parameters collection page for the report. The only required parameter is a season or date range. Users may elect to filter the report results by shop, district (or MDTA) or event. They may also elect to show each event as a separate row in the report. When the form is submitted EORS retrieves all data matching the search criteria and displays a printable report using Microsoft SQL Reporting Services. Previously, the Salt Usage Report displayed snow and ice accumulation using the modified depth (snow + 10 * ice). Any calculations involving frozen precipitations used the

modified depth. As of the WO52 Phase 2 release, snow, ice and modified depths will be displayed in separate columns. Any calculations involving frozen precipitation accumulations will still use the modified depth.
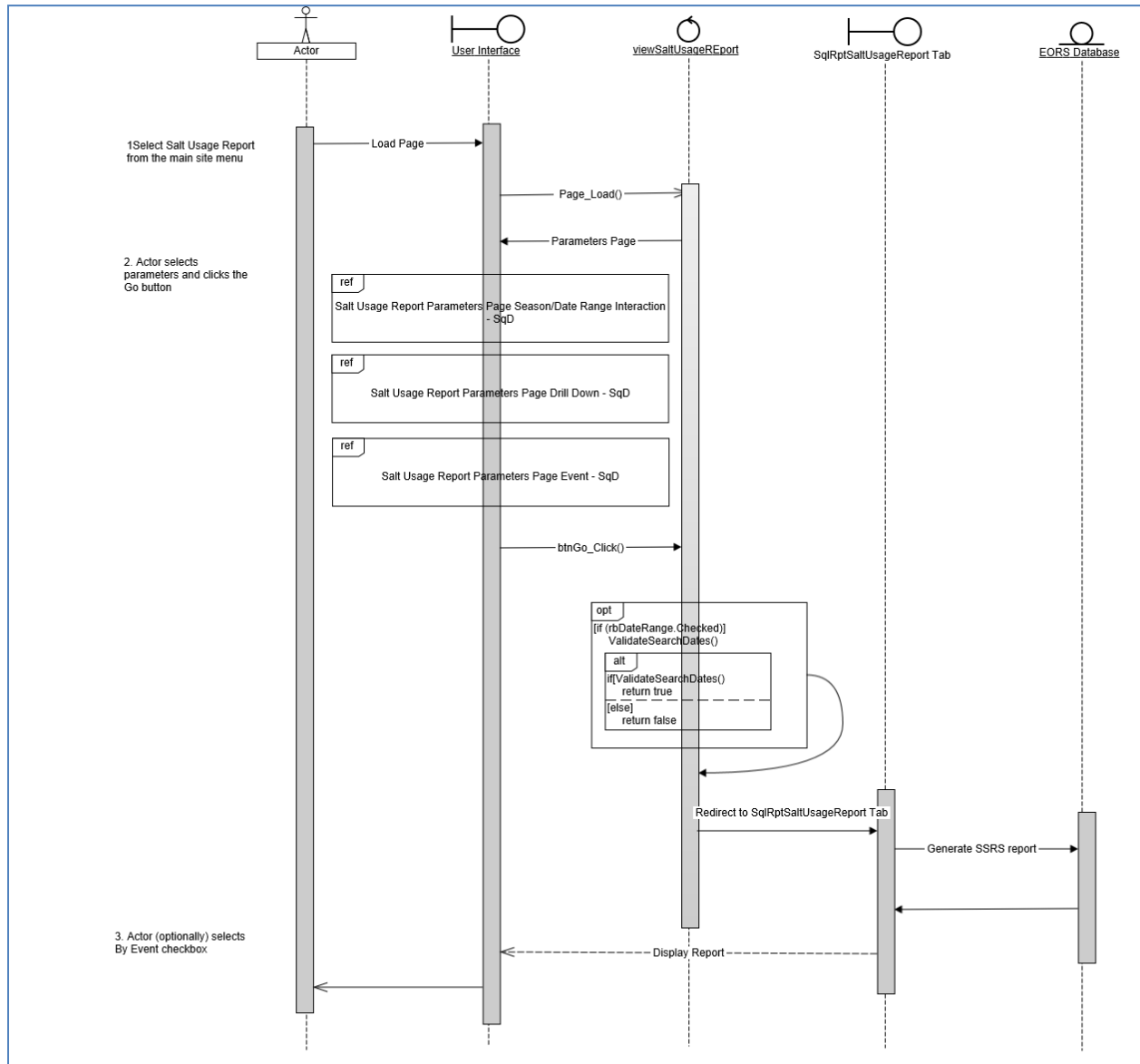
Figure 3-15 Salt Usage Report Sequence Diagram – SD
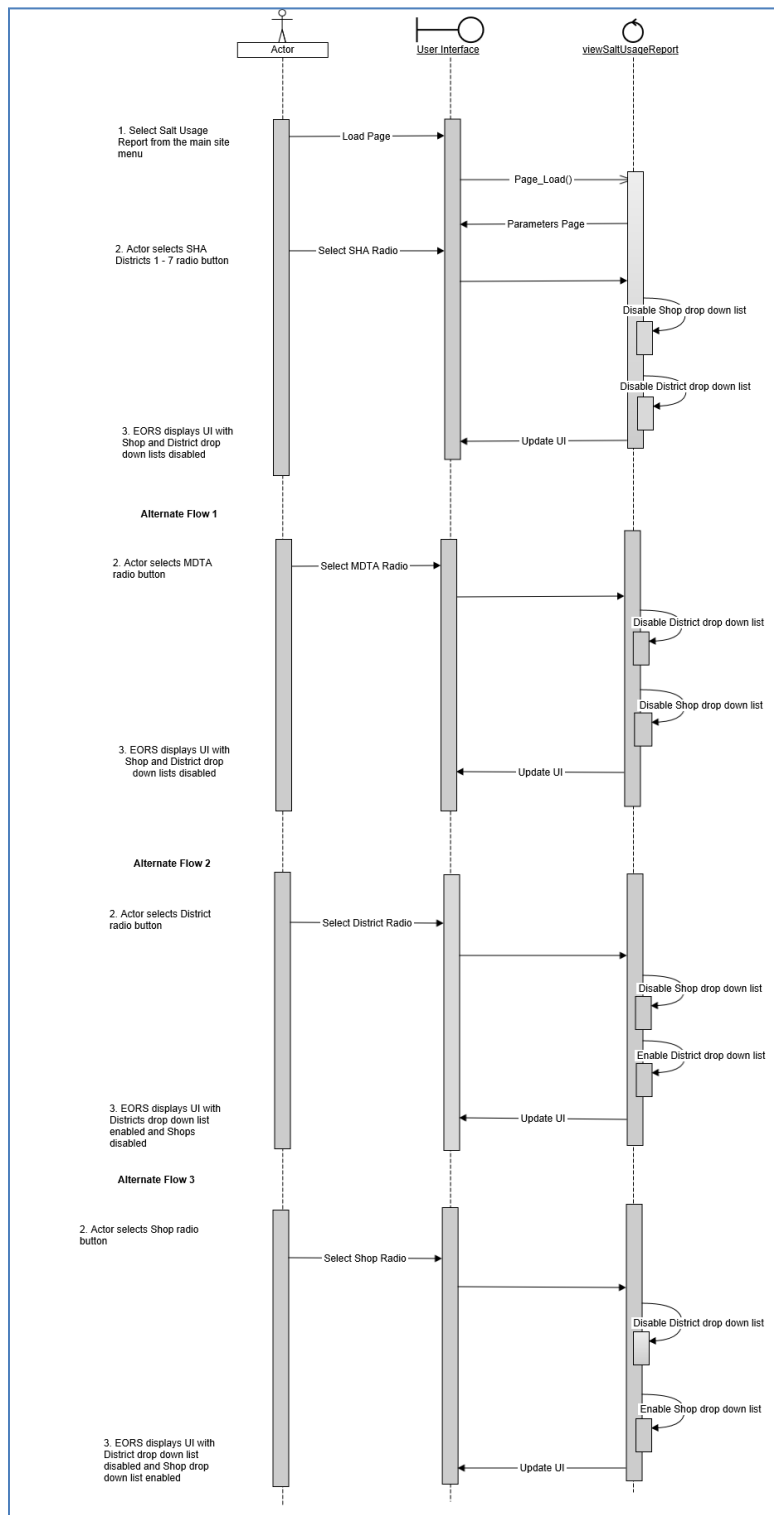
Figure 3-16 Salt Usage Report Parameters Page Drill Down – SqD
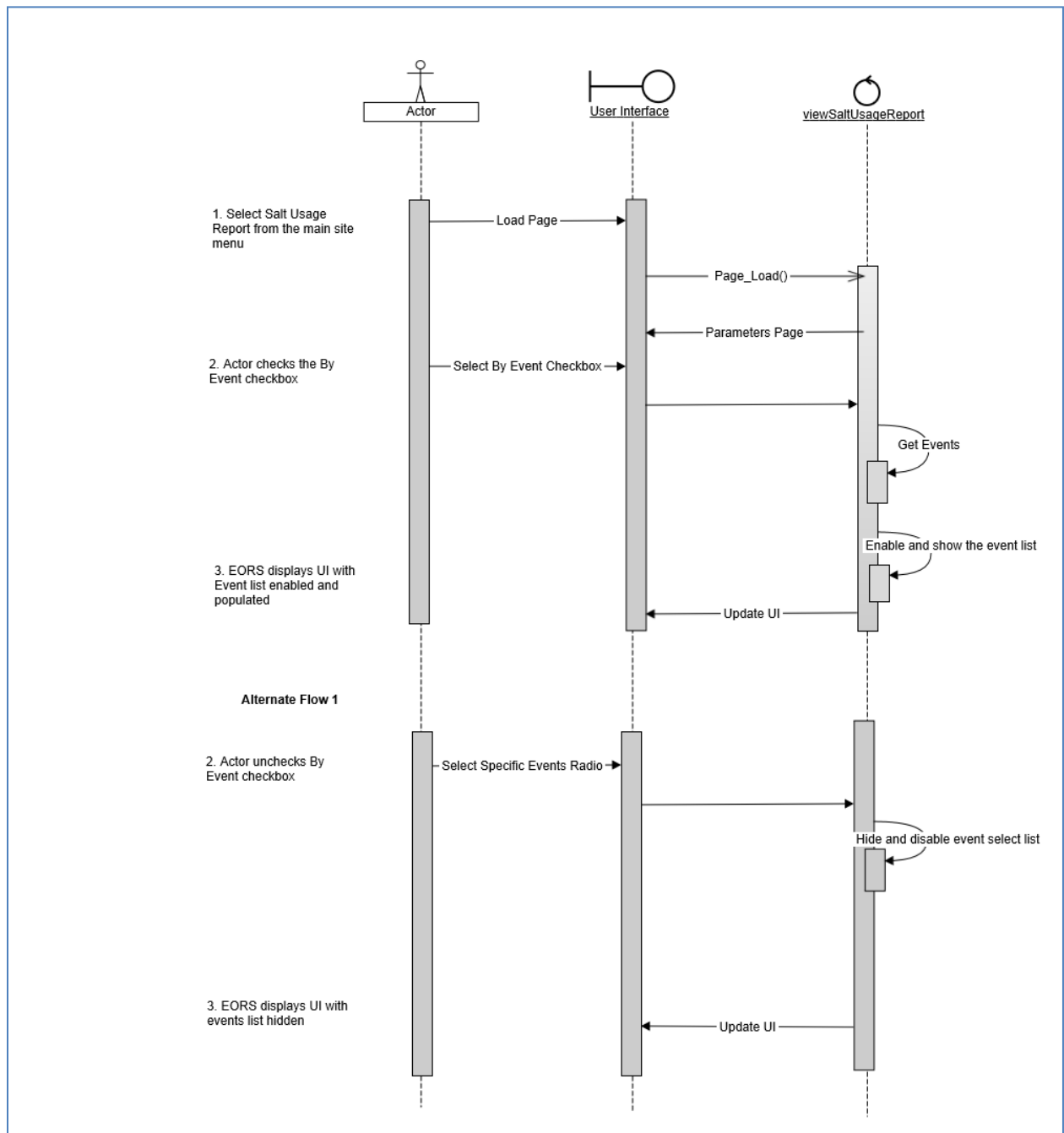
Figure 3-17 Salt Usage Report Parameters Page Event – SqD
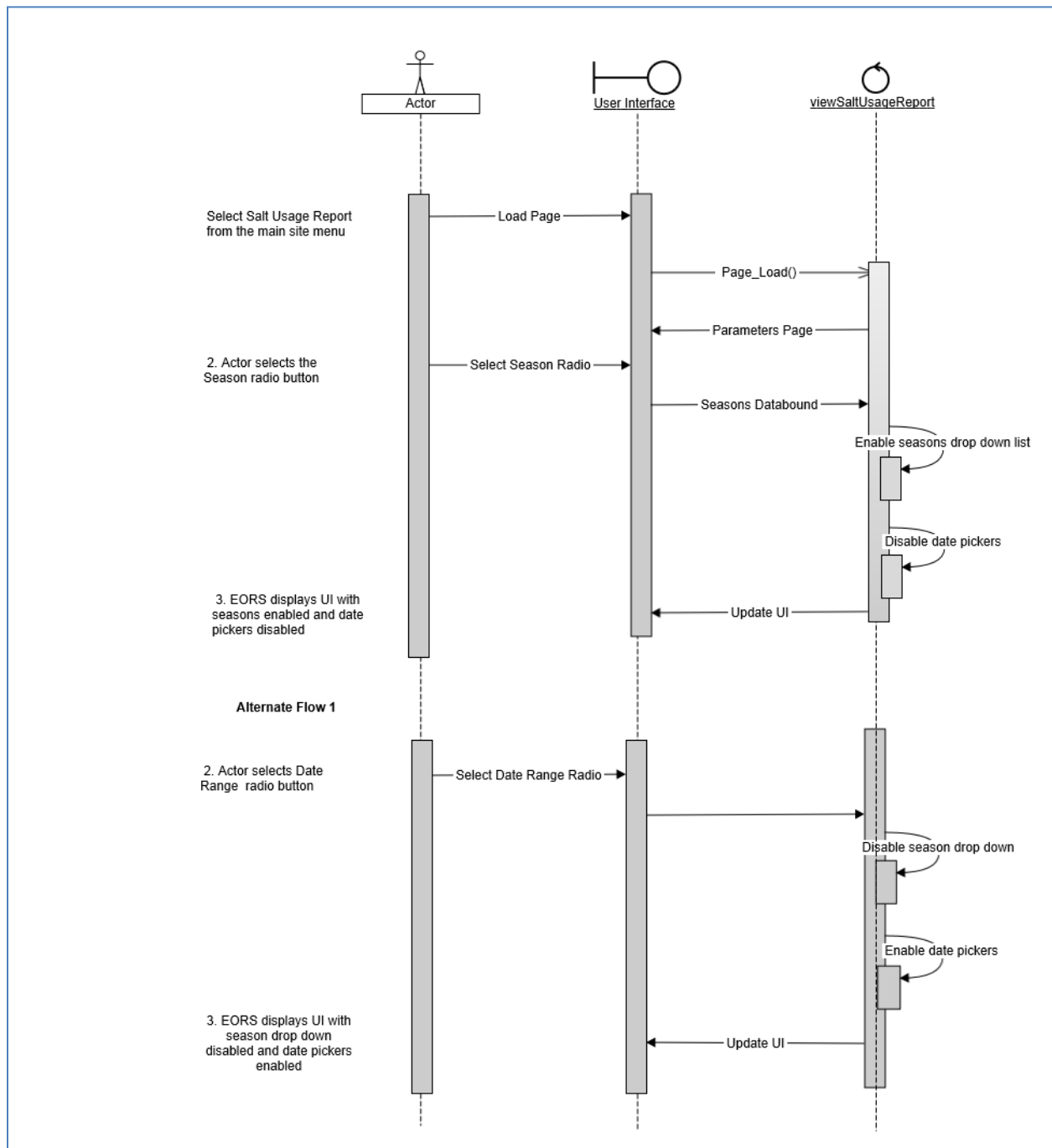
Figure 3-18 Salt Usage Report Parameters Page Season/Date Range Interaction – SqD

3.7 Winter Operations Performance Report

The Winter Operations Performance Report was requested by the Office of Maintenance (OOM). Prior to WO52 EORS Phase 2, the Winter Operations Performance Report displayed the modified depth field for frozen precipitation accumulation in the report. The Maryland State Highway Administration requested that the Winter Operations Performance Report be altered to

display snow accumulation, ice accumulation and modified depth in separate columns in the report. The goal of the report is to give OOM personnel an overview of the shop performance for each shop on each winter storm response. The output of the report will be grouped by event ID and each shop that responded to the event will be represented by a row in the event group. Shops that did not respond to an event will not be included in it group in the report. Each event will be displayed in the report in tabular form and will show the event ID above the table. The data for the report is taken from the EORSV2 database event shop reports and returned using the stored procedure named *EORS_Report_Winter_Ops_Performance*.

The table below lists all of the fields that will be displayed in the report. With each field in the table is a description of what the expected value of the field should be and how it is calculated. In some of the field descriptions (e.g. Mobilization Time, Precipitation Begin, etc.) there will be a phrase such as the "first report" or "last report". This is significant in the calculations used in the report.

Field	Description
District	District number or MDTA where the shop is assigned
Shop	Shop number and name
Season	The season in which the event occurred
Event Start Time	Timestamp for the first report that is not Pre-event Operations.
Operations Complete time	Timestamp for the report where the shop chose "Operations Complete" as their operations type.
Event Duration	Number of hours from first report to Ops Complete regardless of first report Ops Type.
Max Personnel	These fields will contain the largest number of state personnel reported at any one time for the shop during the event. All shop reports for the event will be searched.
Max Contract Dump Trucks	These fields will contain the largest number of contract dump trucks reported at any one time for the shop during the event. All shop reports for the event will be searched.
Max State Dump Trucks	These fields will contain the largest number of state dump trucks reported at any one time for the shop during the event. All shop reports for the event will be searched.
Min Pavement Temperature	These fields will contain the lowest pavement temperature reported for the shop during the event. All shop reports for the event will be searched.
Precipitation Begin	Timestamp of the first shop report where frozen precipitation was reported on the weather tab
Precipitation End	Timestamp of the first shop report where no frozen precipitation was reported after the Precipitation Start time
Frozen Precipitation Duration	Timespan in hours between Precipitation Start and Precipitation End
Snow Accumulation	The maximum amount of snow accumulation reported by the shop during the event
Ice Accumulation	The maximum amount of snow accumulation reported by the shop during the event
Modified Depth	The maximum modified depth reported by the shop during the event

Restore Bare Pavement Time	The timestamp of the shop report when bare pavement was achieved. Bare pavement occurs when a shop reports roads as dry, wet or N/A after they have been reported with some coverage
Achieved Bare Pavement Time	The timespan between precipitation end and road restore time
Salt Used	The tones of salt used by the shop for the storm response
LBL/Lane Mile/Inch	The pounds of slat used per lane mile per inch of snow ice accumulation. The lane miles for each shop are stored in the database. The calculation used is: Tons of Salt * 2000 / Lane Miles/ Accumulation reported

Report Parameters

The Winter Operations Performance Report takes multiple parameters. The only required parameter is a date range. The date range may be sent as a season or as starting and ending dates if a partial season is desired. The report will display all events that were active during the season/date range supplied. The report may also be run for one or more specific event IDs. If events ID(s) are sent, the report will only contain those events for the event ID's specified.. Lastly, the report may be filtered by shop or district. If a shop or district (or MDTA) is used as a parameter, only that shop/district/MDTA will be displayed in the report.

Report parameters may be combined to produce different reports. A season or date range may be combined with a shop or district to produce a report that only contains data for the specified shop/district over the given timespan. A season or date range may also be combined with one or more event IDs to produce a report that contains data for the specified events and date range/season. Also, a season/date range may be combined with a shop or district and with event IDs to produce a report that contains data for the shop/district for the specified event(s) over the given timespan.

The following table shows the parameters that the Winter Operations Performance Report can accept. The first column is the parameter name. The second column is a description of the parameter and the third column shows what parameters it may be combined with.

Parameter	Description	Combine With
Season (default)	The season parameter is a string such as 2014-2015. It will be automatically converted to a date range in the report. Each season begins on July 1 and ends June 30. For example the season 2014-2015 will be converted to July 1, 2014 - June 30, 2015. In this case the report will include all events between the converted dates.	Shop, District/MDTA, Event(s)
Date Range	Time pickers may be used to send a specific date range to the report. In this case no conversion needs to take place in the report. The report will include all events between the specified dates.	Shop, District/MDTA, Event(s)
No Drill Down (default)	No shop or district/MDTA filtering will occur. All shops, districts and MDTA will be included in the report.	Season, Date Range, Event(s)
Shop	Only the specified shop will be included in the report	Season, Date Range, Event(s)

District	Only the specified district/MDTA will be included in the report	Season, Date Range, Event(s)
Include All Events (default)	All events over the specified season/date range will be included in the report.	Season, Date Range, Shop, District
Specific Events(s)	Only the specified event(s) will be included in the report	Season, Date Range, Shop, District

The default parameter set for the report is (current) season, no drill down and include all events.

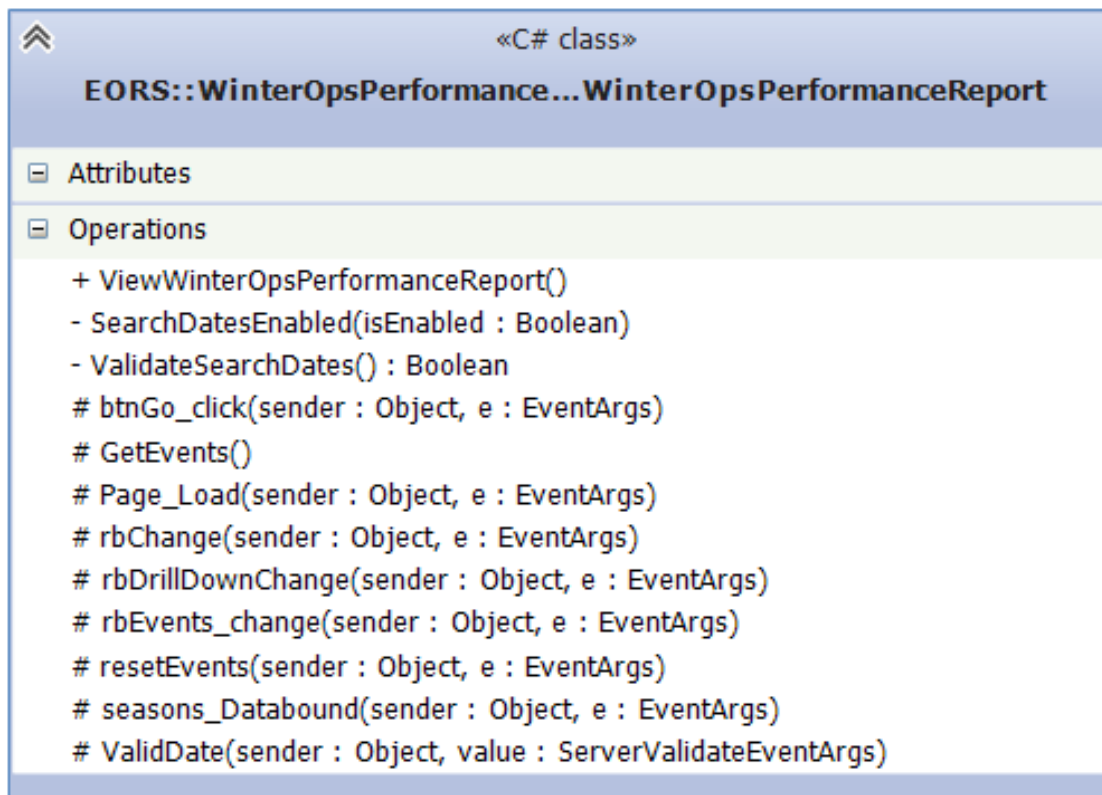### 3.7.1 Winter Operations Performance Report Class Diagram

«C# class»
EORS::WinterOpsPerformance...WinterOpsPerformanceReport

☐ Attributes

☐ Operations

    + ViewWinterOpsPerformanceReport()
    - SearchDatesEnabled(isEnabled : Boolean)
    - ValidateSearchDates() : Boolean
    # btnGo_click(sender : Object, e : EventArgs)
    # GetEvents()
    # Page_Load(sender : Object, e : EventArgs)
    # rbChange(sender : Object, e : EventArgs)
    # rbDrillDownChange(sender : Object, e : EventArgs)
    # rbEvents_change(sender : Object, e : EventArgs)
    # resetEvents(sender : Object, e : EventArgs)
    # seasons_Databound(sender : Object, e : EventArgs)
    # ValidDate(sender : Object, value : ServerValidateEventArgs)

Figure 3-19 Winter Operations Performance Report Class Diagram – CD

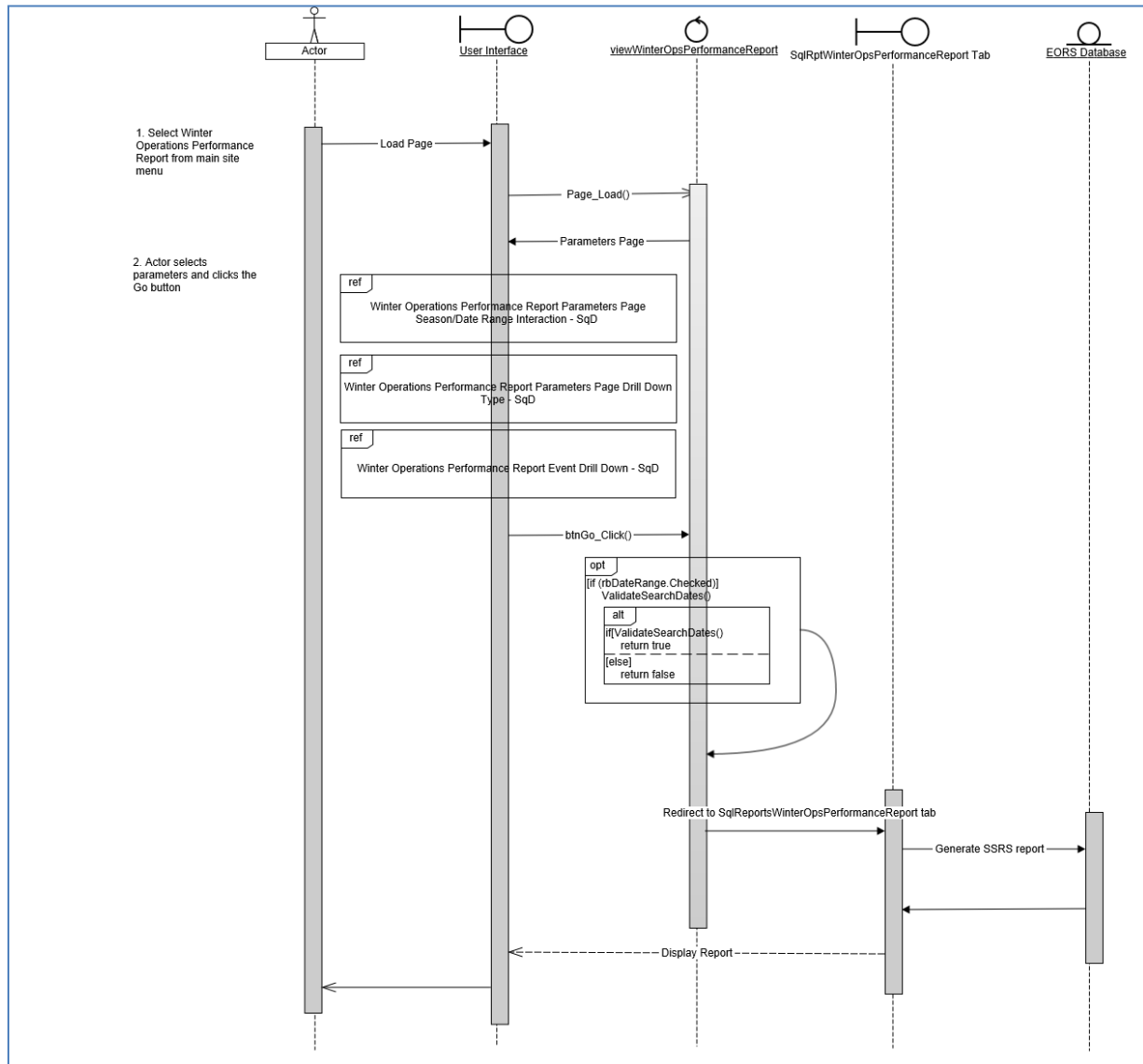### 3.7.2 Winter Operations Performance Report Overview Sequence Diagram

Figure 3-20 Winter Operations Performance Report Sequence Diagram – SD

3.7.1 Winter Operations Performance Report Parameters Season/Date Range Interaction Sequence Diagram
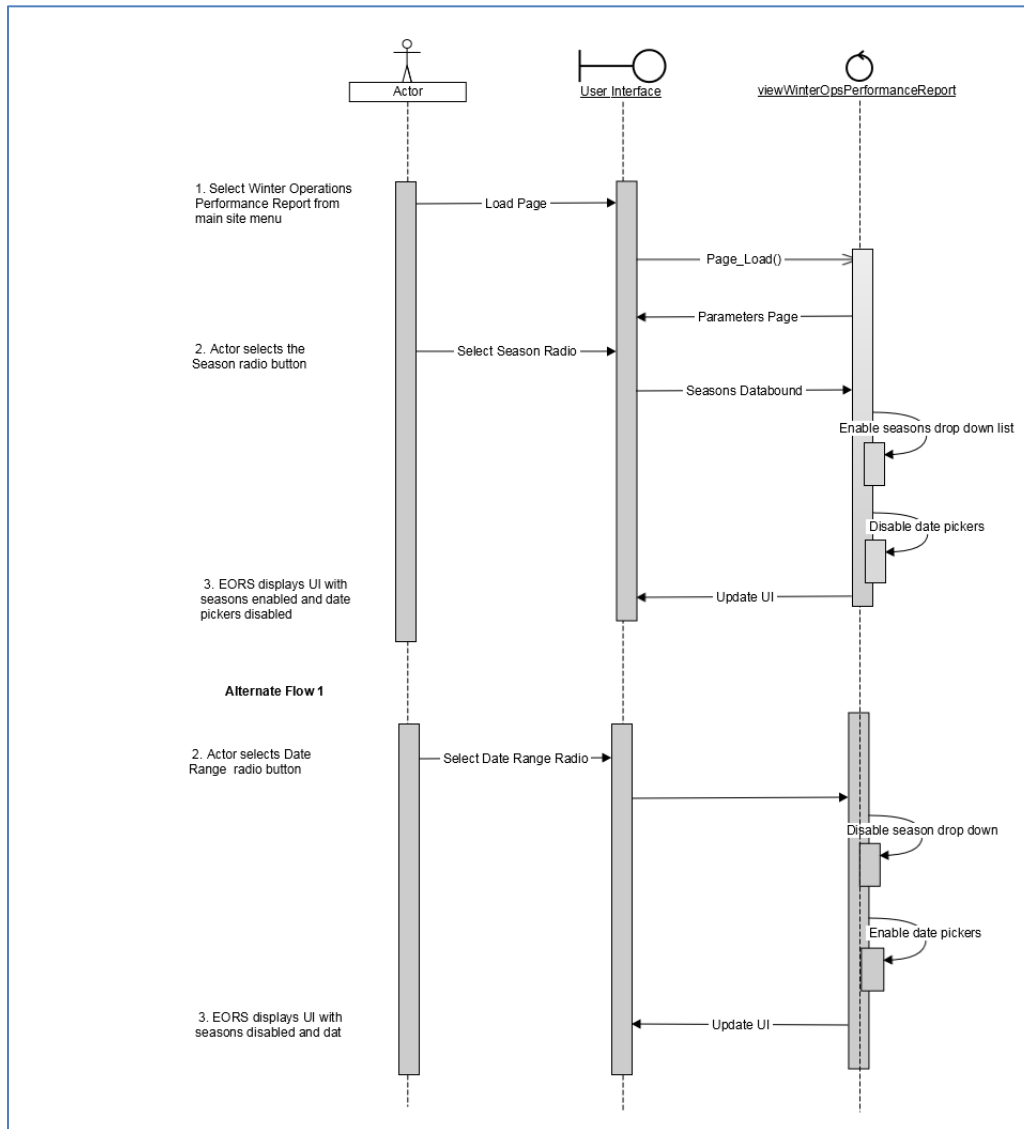

Figure 3-21 Winter Operations Performance Report Parameters Page Season/Date Range Interaction – SqD

3.7.2 Winter Operations Performance Report Parameters Page Event Drill Down
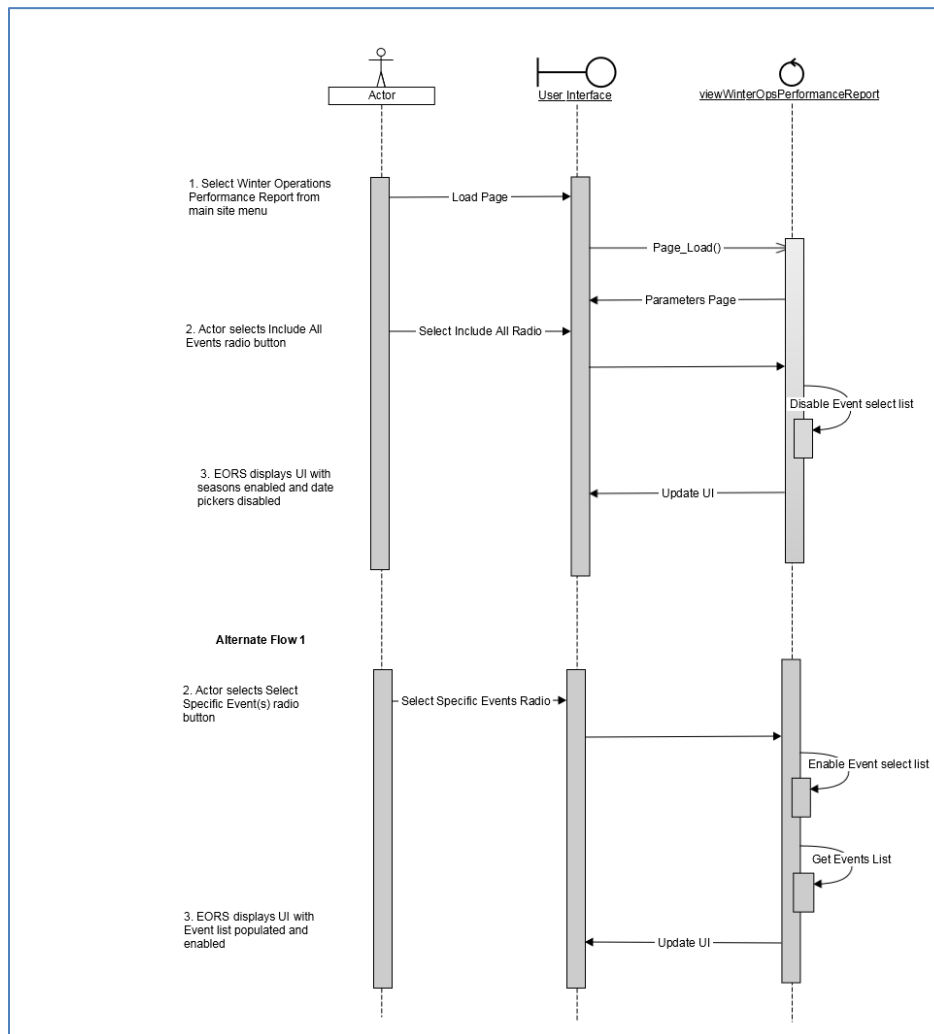

Figure 3-22 Winter Ops Performance Report Parameters Page Event Drill Down – SqD

3.7.3 Winter Operations Performance Report Page Drilldown Type Sequence Diagram
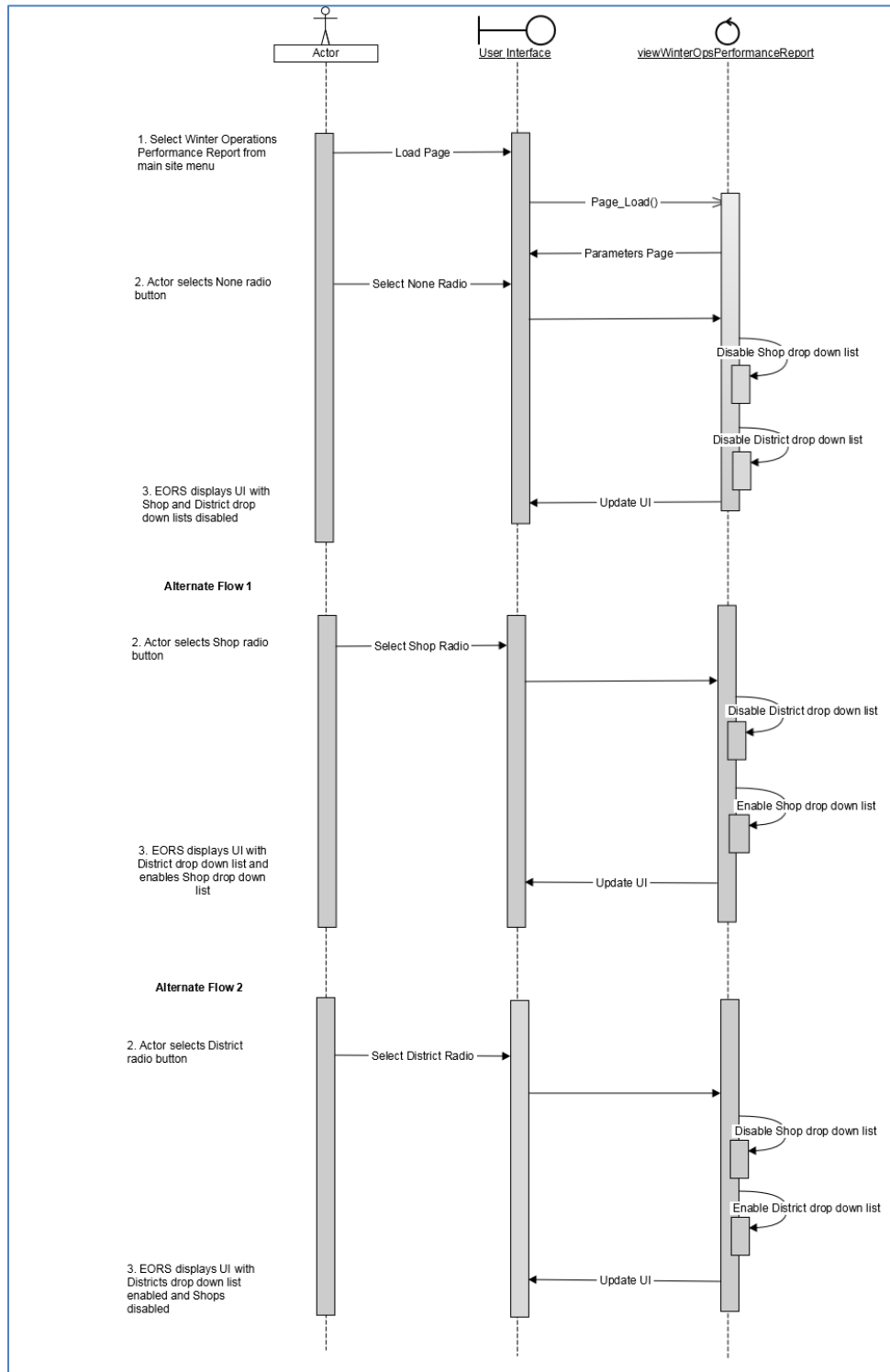

Figure 3-23 Winter Operations Performance Report Parameters Page Drill Down Type – SqD

3.8 Summarized List of Final Snow Accumulation Totals

WO52 Phase 2 will require changes to the Summarized List of Final Snow Accumulation totals report and its parameters page. The parameters page will be updated to allow users to filter the report by district, shop and event. Filtering by shop or district may be used in conjunction with filtering by event or they may be separate.

Other changes to the Summarized List of Final Snow Accumulation totals report include re-ordering the report by district and shop rather than by county and replacing the County header in the report with district header.

The Summarized List of Final Snow Accumulation Totals Report is designed to provide as printable report of frozen precipitation totals for each shop over the given time period. The report will also contain totals for each shop in the report.

The following table describes each field in the report:

Field	Description
District	There will be a district header for each district
Shop	Shop name only. Shop name will be listed for each shop/event
Event ID	Identifier for the event the precipitation was reported upon.
Snow Accum	The maximum snow accumulation that was reported by the shop for the event
Ice Accum	The maximum ice accumulation that was reported by the shop for the event
Modified Depth	The accumulation achieved by using the conversion factor of 1 in. ice = 10 in. snow. Modified depth = snow + ice * 10
Date/Time Reported	The date time the maximum modified depth was reported
Operations Type	The ops type the shop was in when the maximum precipitation was reported

The Summarized List of Final Snow Accumulation Totals Report takes multiple parameters. The report must be run for a time span. The time span may be a season or a custom date range. The report will return all winter storm events that occurred within the given time span.

The report may also be filtered by district, shop or event. When filtering by district all shops within the selected district and time span will be included in the report. When filtering by shop, only the selected shop will be included in the report. Likewise, when event is applied as a filter, only the selected event will appear in the report. Any combination of shop, district and event parameters may be used.

The following table describes the parameters that the report will accept:

Parameter	Description	Combine With
Season	Season to search for events,	District, Shop, Event
Date Range	Select only events that occurred within this date range	District, Shop, Event
District	Only include events for shops from the selected district	Season, Date Range, Shop, Event
Shop	Only include events for the selected shop	Season, Date Range, District, Event
Event	Only include a single winter event	Season, Date Range, District, Shop

3.8.1 Summarized List of Final Snow Accumulation Report Class Diagram

Figure 3-24 Summarized List of Final Accumulation totals Class Diagram – CD

3.8.1 Summarized List of Final Snow Accumulation Totals Report – SD

The diagram below shows the sequence of events and interaction of EORS components when a user runs the Summarized List of Final Snow Accumulation Totals Report. To run a Summarized List of Final Snow Accumulation Totals Report the user navigates to the parameters page, enters the search parameters and submits the form. When the form is submitted EORS retrieves all data matching the search criteria and displays a printable report using Microsoft SQL Reporting Services.
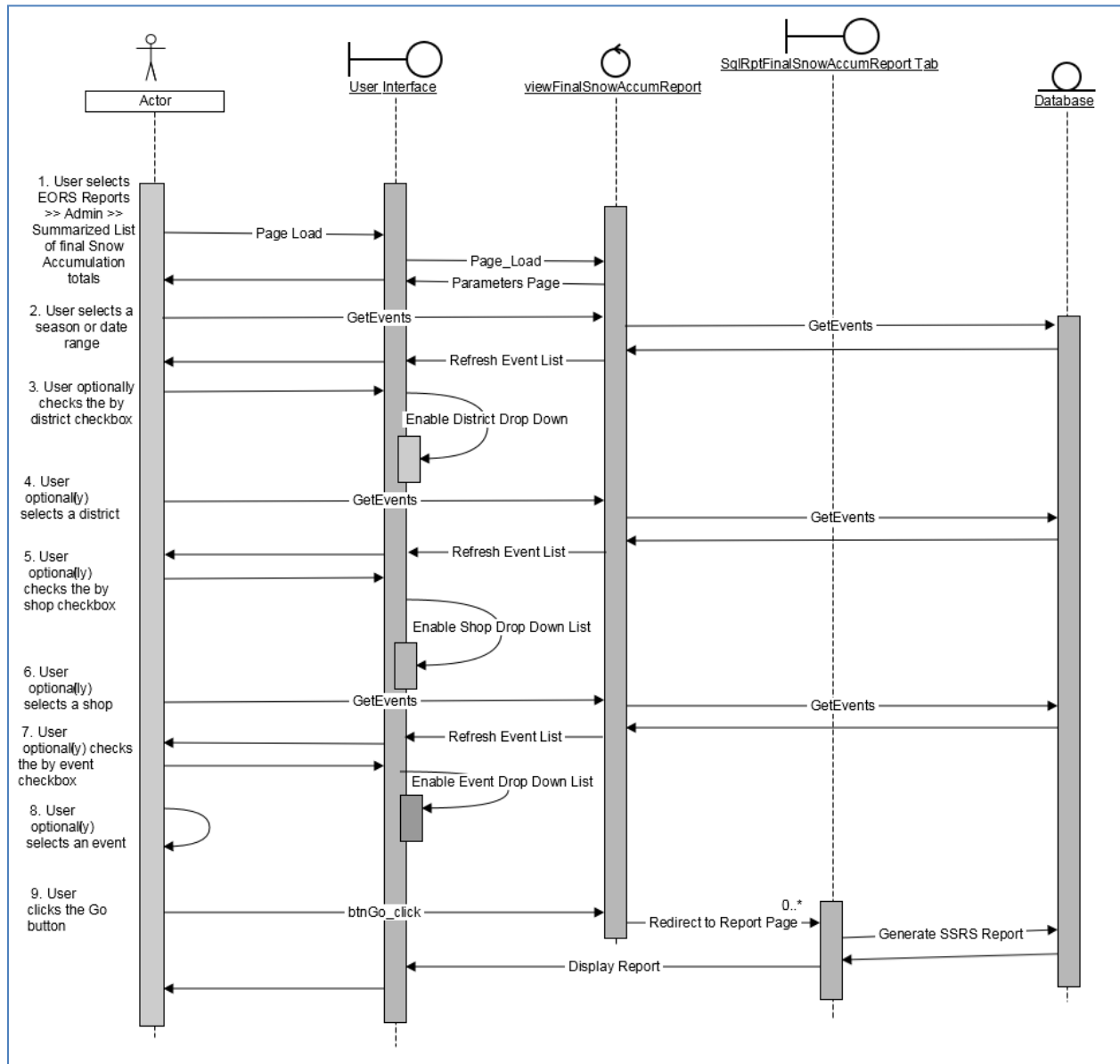

Figure 3-25 Summarized List of Final Snow Accumulation Totals Report – SD

3.9 Add Ice to Post Storm Review

The Maryland State Highway Administration requested that the report and interface include snow depth and ice depth output and entry. Fields will be added to the Review Panel
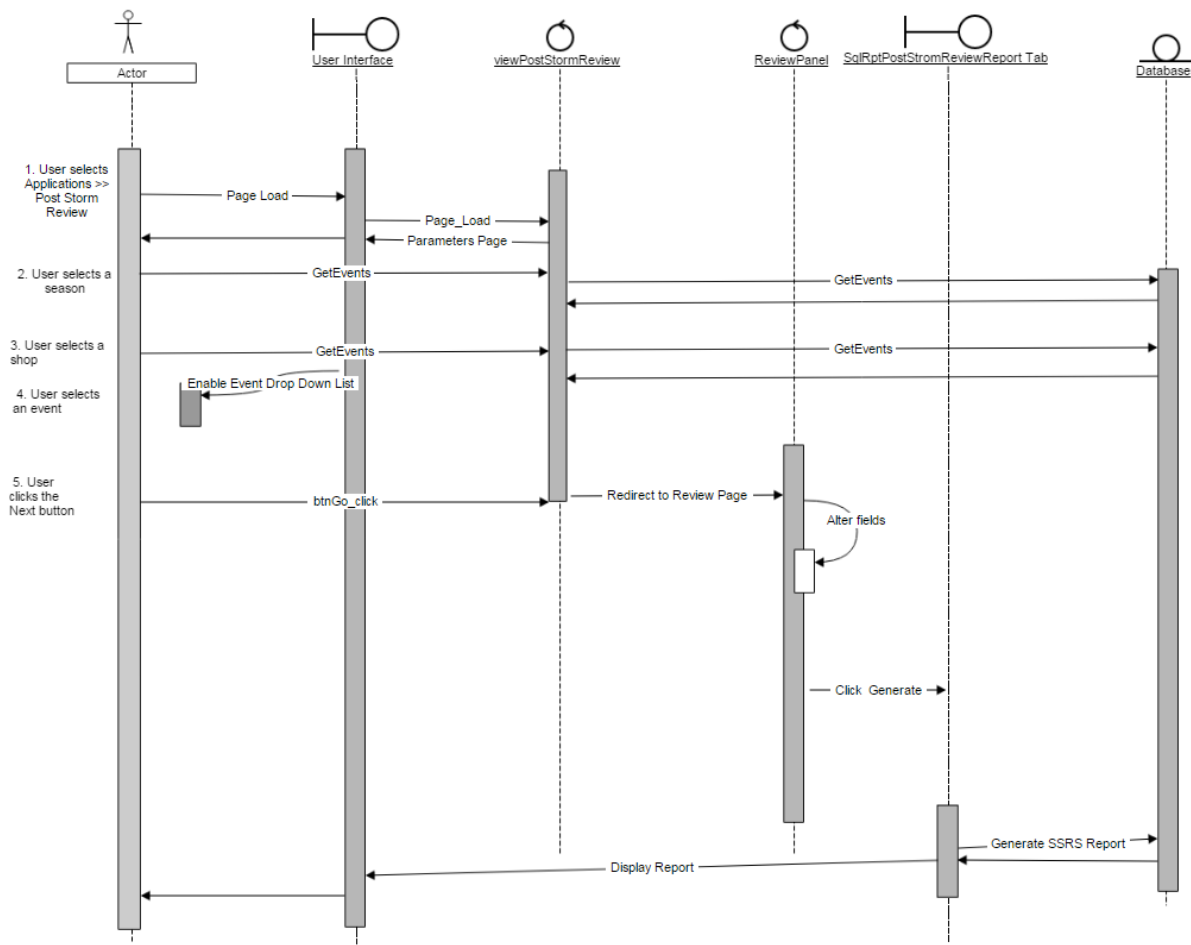
Figure 3-26 Post Storm Review – SD

3.10 Add Ice to Situational Awareness

Prior to WO 52 Phase 2 EORS displayed the modified depth (snow + 10 * ice) field in the District Summary section of Situational Awareness. The Maryland State Highway Administration requested that the summary show snow depth and ice depth and remove modified depth from the table. To fulfill this we will replace the accumulation column with snow and ice columns. This happens in the district panels
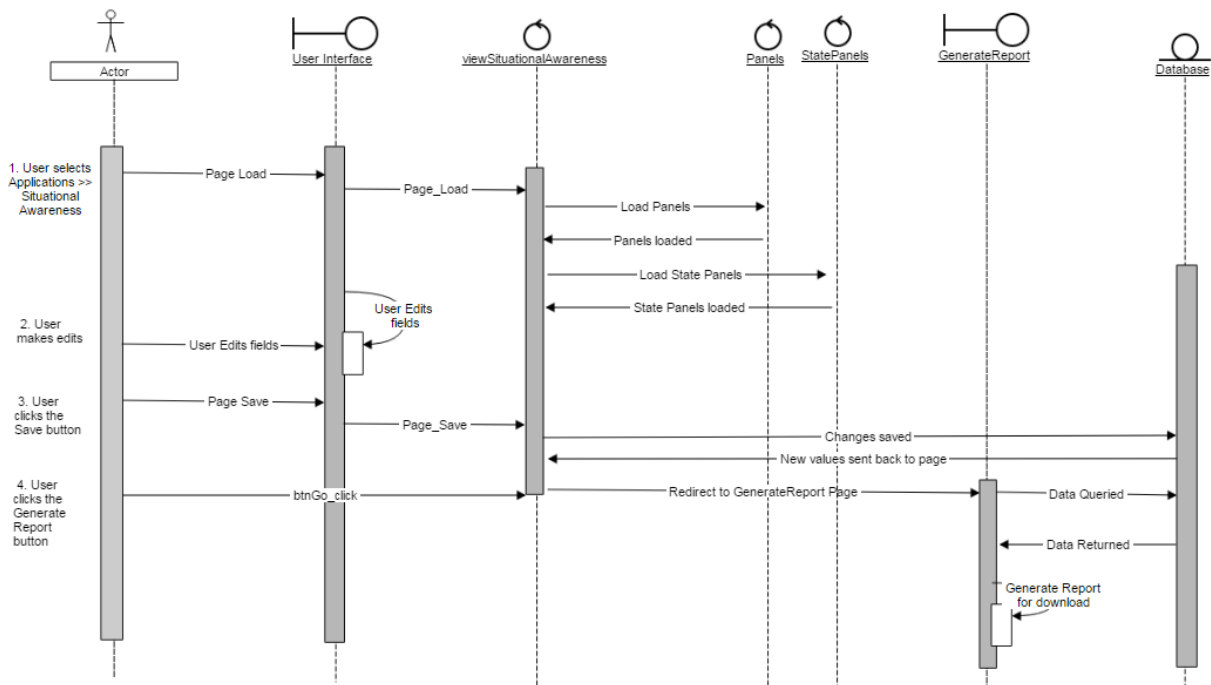
Figure 3-27 Situational Awareness – SD

3.11 Time to Restore Bare Pavement Report

Prior to WO 52 Phase 2 EORS displayed the modified depth (snow + 10 * ice) field in the Time to Restore Bare Pavement Report. The Maryland State Highway Administration requested that the report show snow depth, ice depth and modified depth in separate columns in the report.

The Time to Restore Bare Pavement Report is designed to give OOM personnel a view of shop performance in their response to winter storm events. The report results will be ordered by district and then by shop. There will be a row in the report for each event/shop combination. The shop/event rows are color coded to show if the shop met the performance measure for the event. The performance measure is as follows:

- If the modified depth (snow + 10 * ice) is greater than 8 inches, no performance measure applies. These rows will be displayed with blue text

- If the modified depth is less than 8 inches and the time to restore bare pavement time (defined in table below – see elapsed time) is less than or equal to 4 hours, the performance measure has been met. These rows will be displayed in black text.

- If the modified depth is less than 8 inches and the time to restore bare pavement is greater than 4 hours, the performance measure has not been met. These rows will be displayed in red text.

The following table describes the fields in the report:

Field	Description

District	District number or MDTA where the shop is assigned
Shop Name	Name of the shop (shop number not included)
Season	Season in which the event occurred
Event ID	ID of event performance metrics are being calculated for the shop
Average Number of Events Per Shop	This field is only used in the District and Statewide Averages rows. It is defined as the number of distinct events that occurred in each shop divided by the number of shops that reported in the district. In the Statewide Averages row it is the number of events that occurred in each shop divided by the number of shops that are reported in the state
Start Time	The time of the first report where precipitation has ended. To qualify, the must have been frozen precipitation reported previously.
End Time	The time of the first report after the start time where road conditions are reported as wet, dry or N/A
Elapsed Time	The time difference between start time and end time
Met Performance Measure for Event	Yes/No if the performance measure was met. • Elapsed time <= 4 hours – yes • Elapsed time > 4 hours – no
Season to Date Percent Success	For shop/event rows this is a running success rate for the shop. In district averages rows it is the average success rate over the district In the statewide averages row it is the average success rate over the state
Season to Date Average Hours Needed to Achieve Bare Pavement	For shop/event rows this is the running average of elapsed time For district averages rows this is the average elapsed time over the district For statewide average row this is the average elapsed time over the state
Snow Accumulation in Inches	The maximum snow accumulation reported for the shop/event
Ice Accumulation in Inches	The maximum ice accumulation reported for the shop/event
Modified Depth in Inches	Max(snow) + 10 * Max(ice)
Season to Date Average Per Event	For shop/event rows this is the running average modified depth For district averages rows this is the average modified depth over the district For the statewide averages row this is the average modified depth

	over the state

The Time to Restore Bare Pavement Report takes multiple parameters. The only required parameter is season or a date range. The report will display all events that occurred during the specified season or within the given date range. Events must be closed to be included in the report.

Optional parameters include drill down by shop or district. If one of these is selected, only shops/events reported upon by the selected shop/district will be included in the report.

Lastly, there is a check box to include/exclude Garrett County in the report. If Garrett County is excluded the District 6 shops will not appear in the report.

The following table describes the parameters that the Time to Restore Bare Pavement Report will accept:

Parameter	Description	Combine With
Season	Season to search for events	No Drill Down, Shop, District, Include/Exclude Garrett County
Date Range	Select only events that occurred within this date range	No Drill Down, Shop, District, Include/Exclude Garrett County
No Drill Down	Do not drill down by shop or district	Season, Date Range Include/Exclude Garrett County
By District	Only include events for shops from the selected district	Season, Date Range Include/Exclude Garrett County
By Shop	Only include events for the selected shop	Season, Date Range Include/Exclude Garrett County

Include Garrett County	When checked, show district 6 shops. When unchecked, exclude district 6.	Season, Date Range, No Drill Down Shop, District

The default parameter set is current season, no drill down, include Garrett County.

3.11.1 Time to Restore Bare Pavement Report Class Diagram

Figure 3-26 Time to Restore Bare Pavement Report Class Diagram – CD

3.11.2 Time to Restore Bare Pavement Report – SD

The diagram below shows the sequence of events and interaction of EORS components when a user runs the Time to Restore Bare Pavement Report. To run a Time to Restore Bare Pavement Report the user navigates to the parameters page, enters the search parameters and submits the form. When the form is submitted EORS retrieves all data matching the search criteria and displays a printable report using Microsoft SQL Reporting Services. All versions of the Time to Restore Bare Pavement Report displayed snow and ice accumulation using the modified depth (snow + 10 * ice). Any calculations involving frozen precipitations used the modified depth. As of the WO52 Phase 2 release, snow, ice and modified depths will be displayed in separate columns. Any calculations involving frozen precipitation accumulations will still use the modified depth.
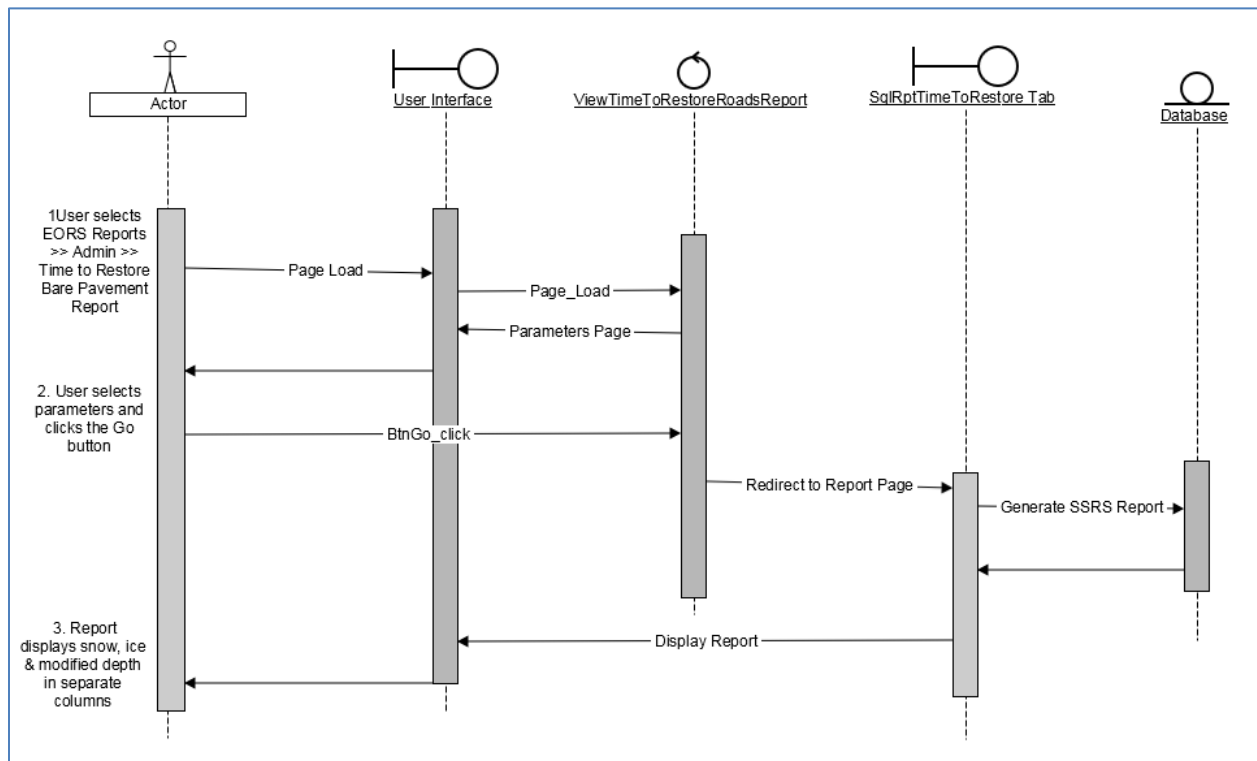
Figure 3-27 Time to Restore Bare Pavement Report – SD

3.12 Winter Event Statistics Report

The Winter Event Statistics Report is designed to show how much frozen precipitation each shop reported over a given time period, the number of events with frozen precipitation and the number of events without frozen precipitation. The report will show snow, ice and modified depth (snow + 10 * ice) in separate columns. District averages will be shown for each district. Additionally, statewide averages will be displayed at the end of the report.

The Winter Event Statistics Report takes season as a single (required) parameter.

The follow table describes the fields in the report:

Field	Description
Maintenance Office/District	This field contains the shop name and number for data rows and the district number for aggregate rows
Number of winter Events w/ Frozen Precipitation	Count of the number of events that occurred over the season where the shop reported frozen precipitation
Total Snow	The sum of the maximum snow depths reported by the shop
Total Ice	The sum of the maximum ice depths reported by the shop
Total Modified Depth	The sum of the maximum snow depths the sum of 10 times the

	maximum ice depths as reported by the shop
Number of winter Events w/o Frozen Precipitation	Count of the number of events that occurred over the season where the shop did not report frozen precipitation

3.12.1 Winter Event Statistics Report Class Diagram

Figure 3-28 Winter Event Statistics Report Class Diagram – CD

3.12.2 Winter Event Statistics Report – SD

The diagram below shows the sequence of events and interaction of EORS components when a user runs the Winter Event Statistics Report. To run a Winter Event Statistics Report, the user navigates to the parameters page, enters the search parameters and submits the form. When the form is submitted EORS retrieves all data matching the search criteria and displays a printable report using Microsoft SQL Reporting Services.
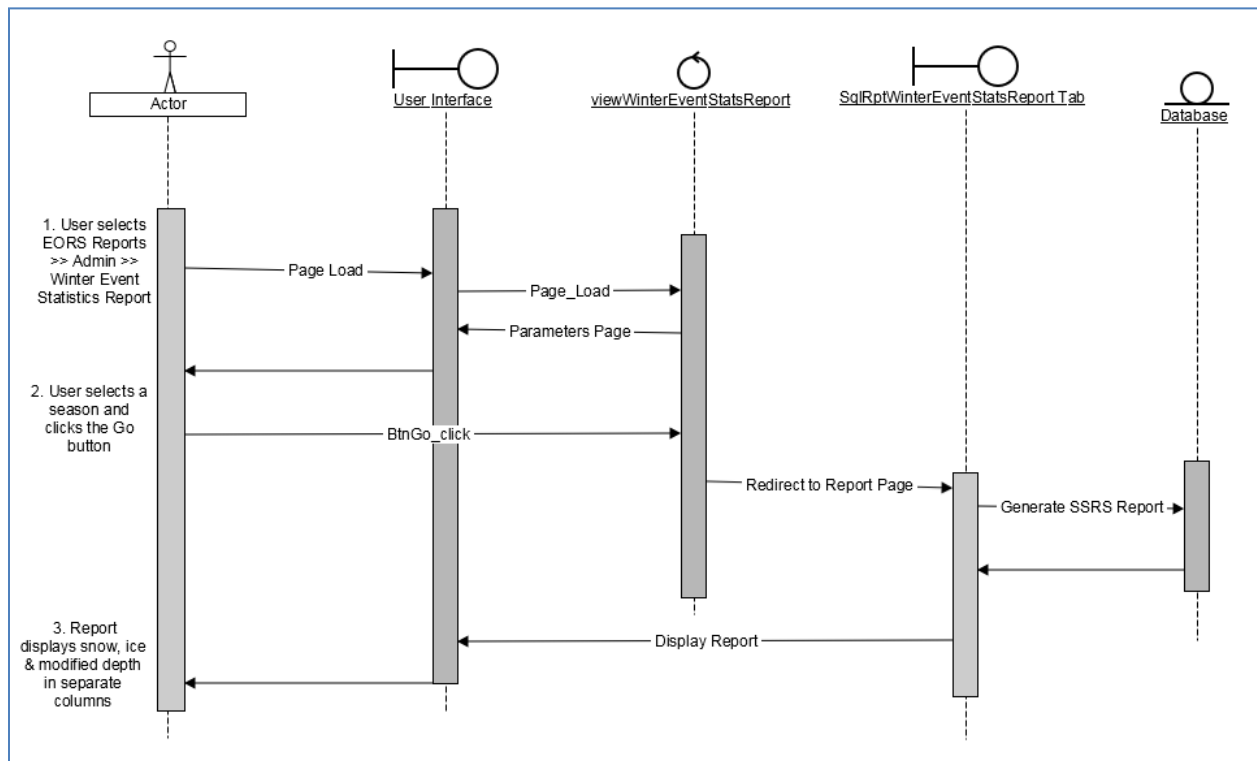
Figure 3-29 Winter Event Statistics Report – SD

3.13 Maximum Precipitation Report

Prior to WO52 Phase 2 the Maximum Precipitation Report includes all shops in SHA and MDTA. The Maryland State Highway Administration requested that the Maximum Precipitation Report and its parameters page be altered so that the report may be run for a single district (or MDTA) and for a single winter storm event.

The Maximum Precipitation Report is designed to provide as printable report of frozen precipitation totals for each shop over the given time period. The report will also contain totals for each shop in the report.

The following table describes each field in the report:

Field	Description
District	There will be a district header for each district
Shop	Shop name only. Shop name will be listed for each shop/event
Event ID	Identifier for the event the precipitation was reported upon.
Report Number	The number for the report where the maximum precipitation was

	reported
Snow Accum	The maximum snow accumulation that was reported by the shop for the event
Ice Accum	The maximum ice accumulation that was reported by the shop for the event
Modified Depth	The accumulation achieved by using the conversion factor of 1 in. ice = 10 in. snow. Modified depth = snow + ice * 10
Date/Time Reported	The date time the maximum modified depth was reported
Operations Type	The ops type the shop was in when the maximum precipitation was reported

The Maximum Precipitation Report takes multiple parameters. The report must be run for a time span. The time span may be a season or a custom date range. The report will return all winter storm events that occurred within the given time span.

The report may also be filtered by district or event. When filtering by district all shops within the selected district and time span will be included in the report. Likewise, when event is applied as a filter, only the selected event will appear in the report. Any combination of district and event parameters may be used.

The following table describes the parameters that the report will accept:

Parameter	Description	Combine With
Season	Season to search for events,	District, Event
Date Range	Select only events that occurred within this date range	District, Event
District	Only include events for shops from the selected district	Season, Date Range, Event
Event	Only include a single winter event	Season, Date Range, District

3.13.1 Maximum Precipitation Report Class Diagram

Figure 3-30 Maximum Precipitation Report Class Diagram – CD

3.13.2 Maximum Precipitation Report – SD

The diagram below shows the sequence of events and interaction of EORS components when a user runs the Maximum Precipitation Report. To run a Maximum Precipitation Report the user navigates to the parameters page, enters the search parameters and submits the form. When the form is submitted EORS retrieves all data matching the search criteria and displays a printable report using Microsoft SQL Reporting Services.
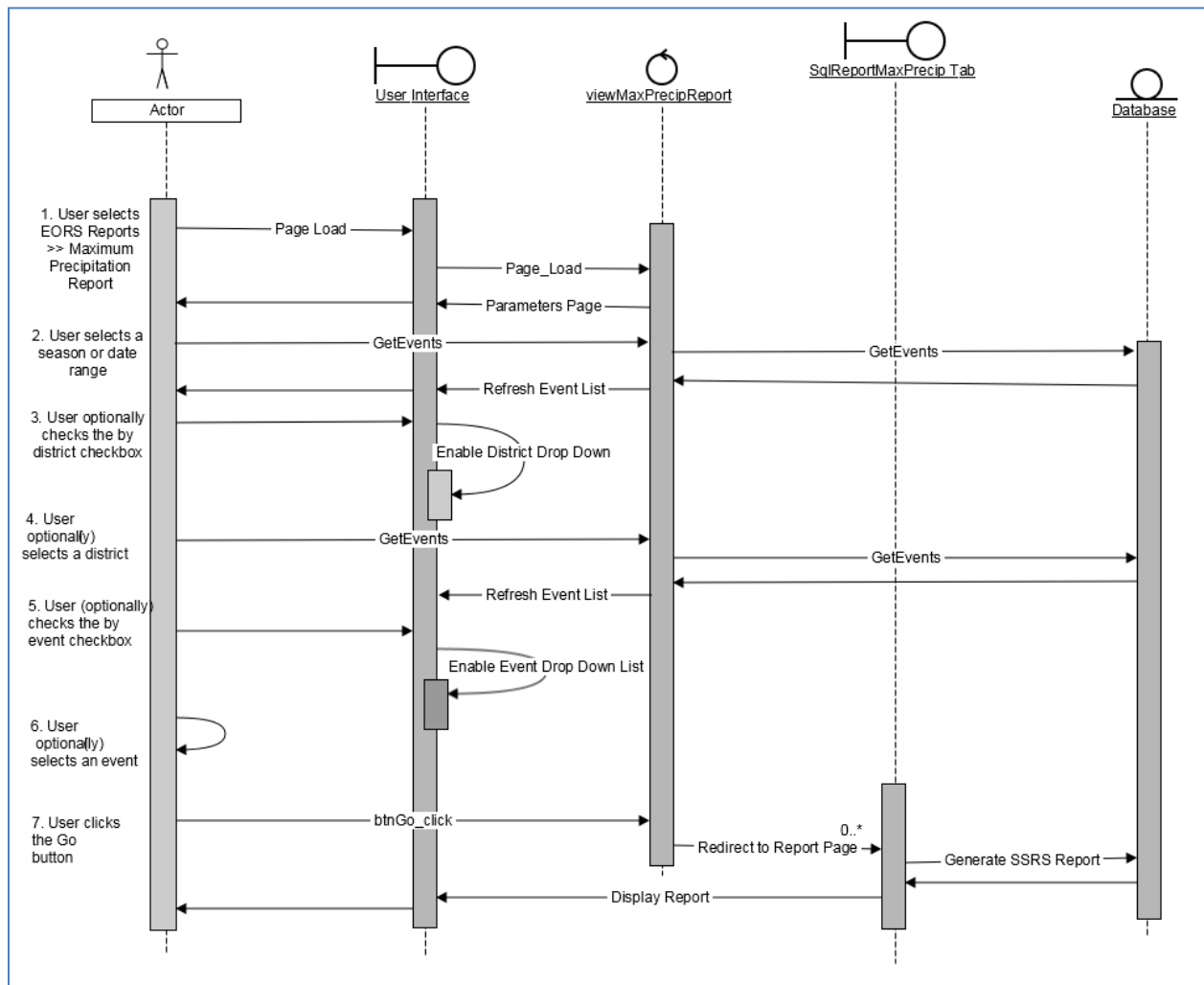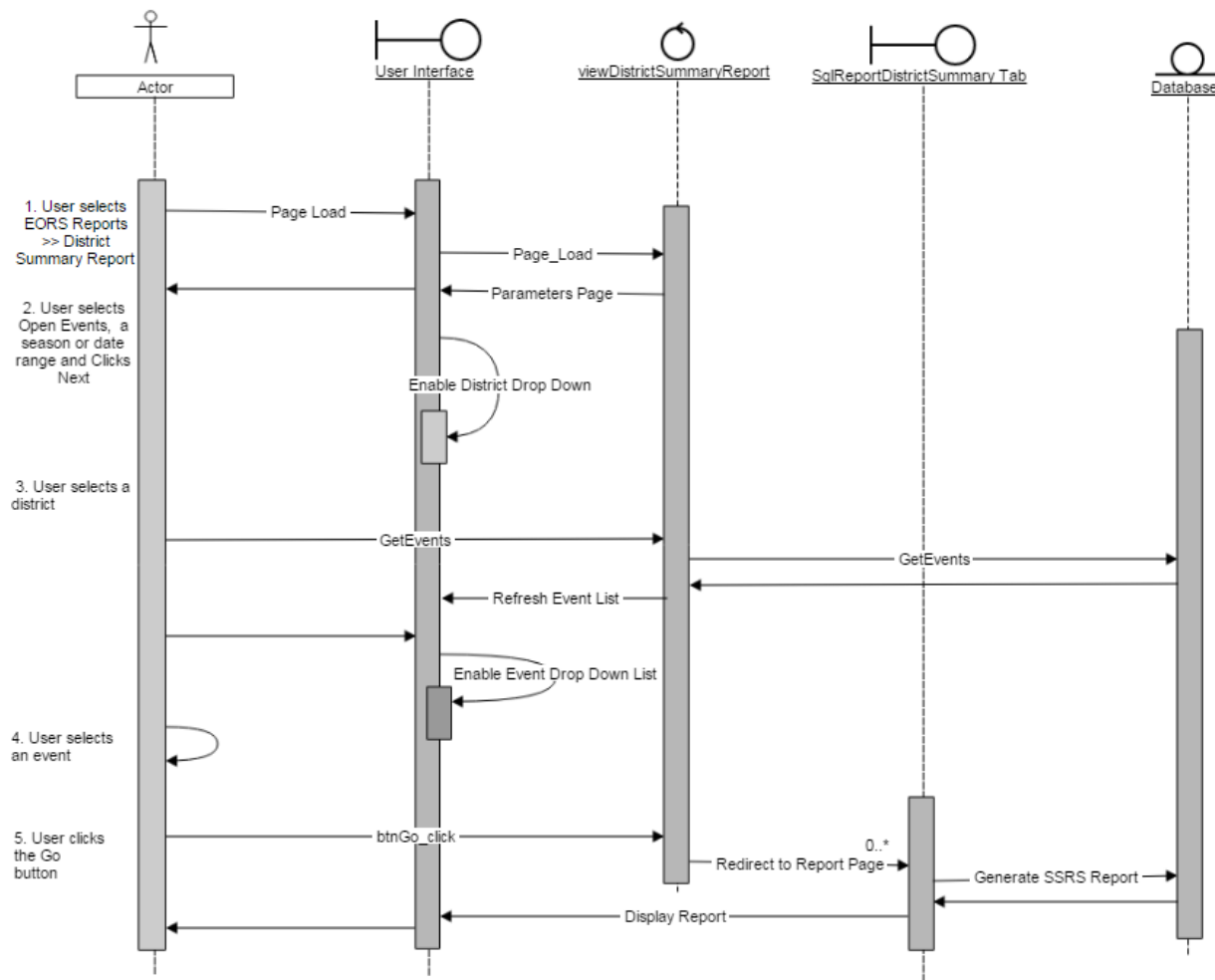
Figure 3-31 Maximum Precipitation Report – SD

3.14 Add Ice to District Summary Report

Prior to WO52 Phase 2 the District Summary Report included modified depth for ice and snow precipitation. The Maryland State Highway Administration requested that the District Summary Report be altered so that the report would show specifically snow and ice accumulation and not modified depth.

The diagram below shows the sequence of events and interaction of EORS components when a user runs the District Summary Report. To run a District Summary Report the user navigates to the parameters page, enters the search parameters and submits the form. When the form is submitted EORS retrieves all data matching the search criteria and displays a printable report using Microsoft SQL Reporting Services.
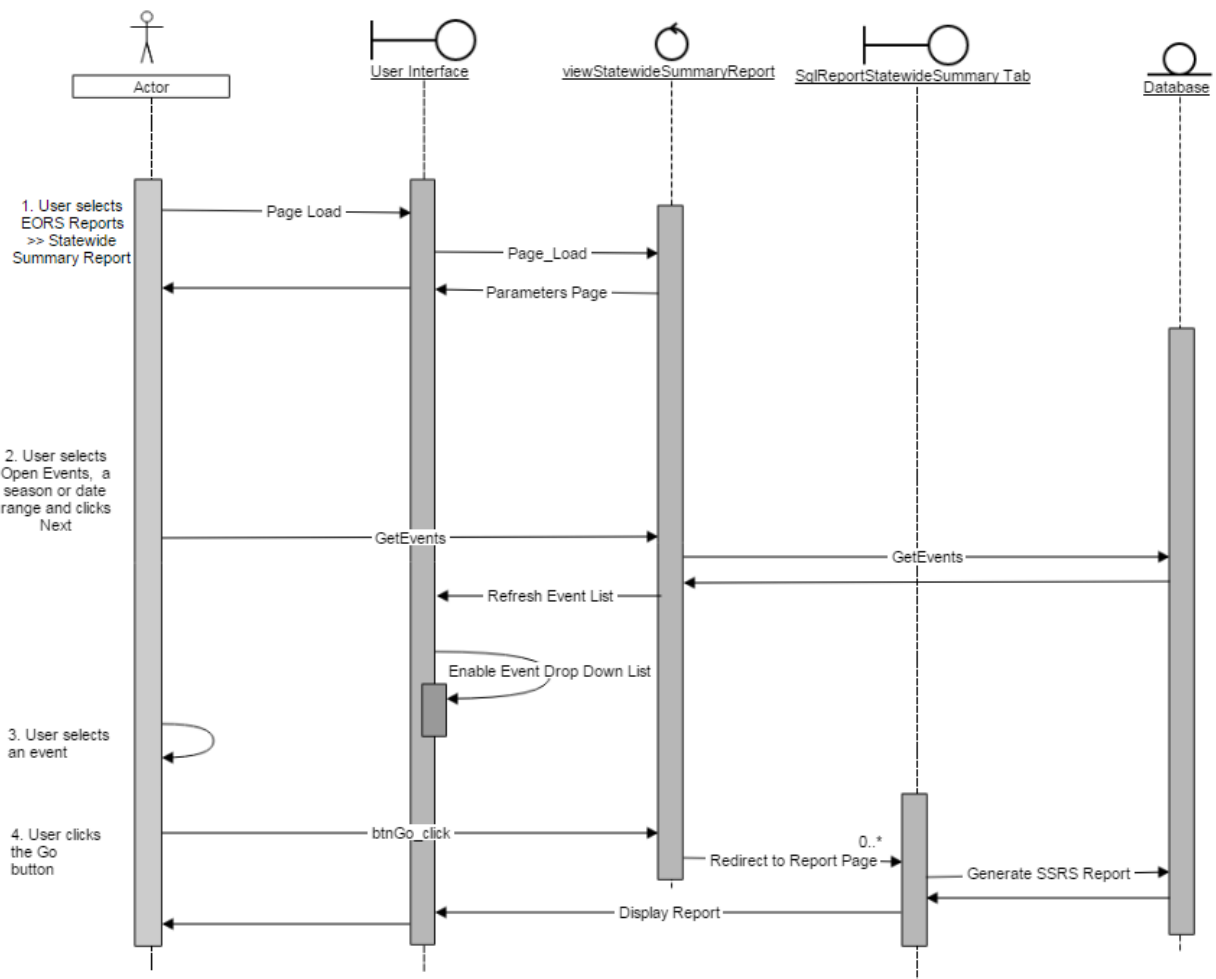
Figure 3-28 District Summary Report – SD

3.15 Add Ice to Statewide Summary Report

Prior to WO52 Phase 2 the Statewide Summary Report included modified depth for ice and snow precipitation. The Maryland State Highway Administration requested that the Statewide Summary Report be altered so that the report would show specifically snow and ice accumulation and not modified depth.

The diagram below shows the sequence of events and interaction of EORS components when a user runs the Statewide Summary Report. To run a Statewide Summary Report the user navigates to the parameters page, enters the search parameters and submits the form. When the form is submitted EORS retrieves all data matching the search criteria and displays a printable report using Microsoft SQL Reporting Services.
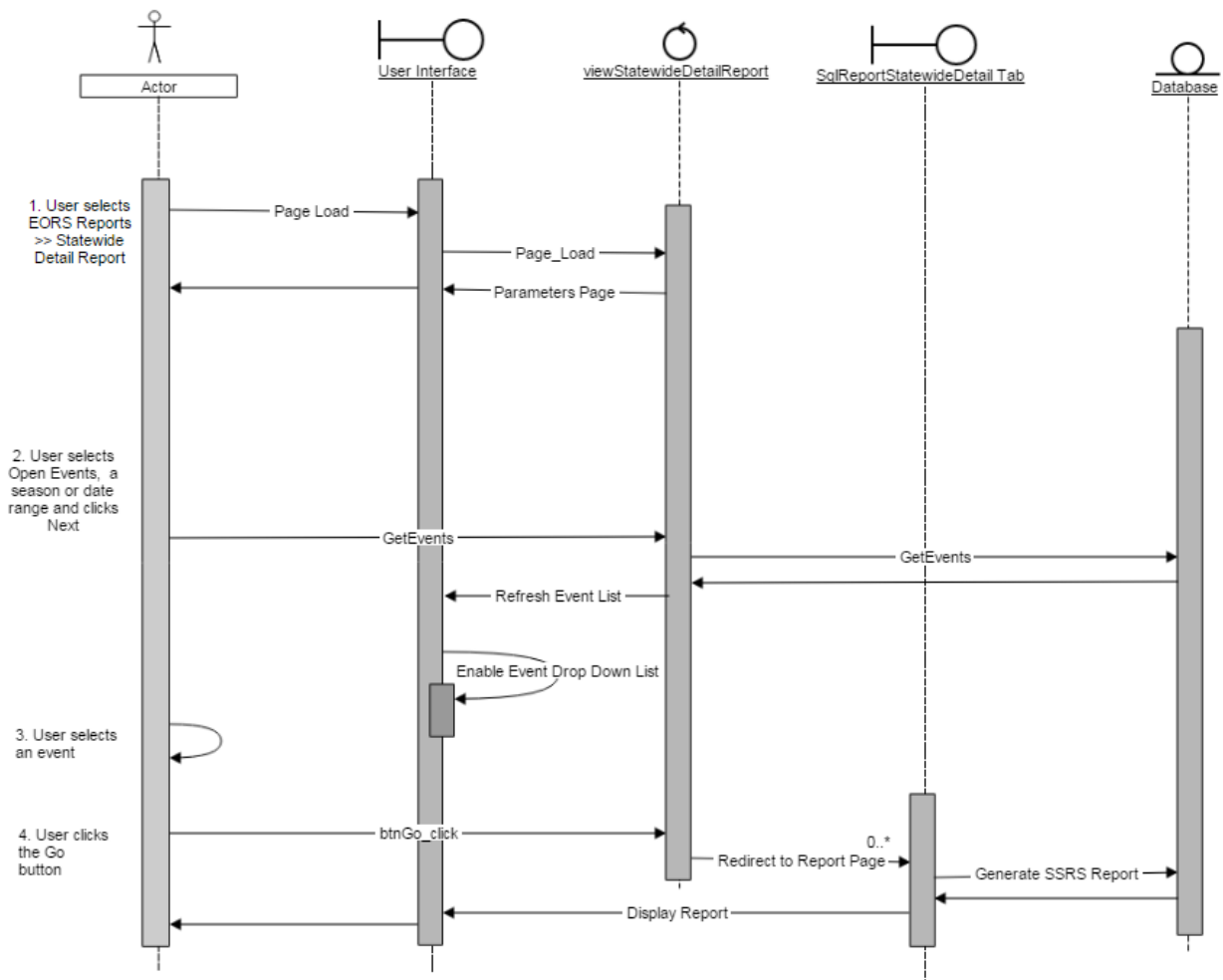
Figure 3-29 Statewide Summary Report – SD

3.16 Add Ice to Statewide Detail Report

Prior to WO52 Phase 2 the Statewide Detail Report included modified depth for ice and snow precipitation. The Maryland State Highway Administration requested that the Statewide Detail Report be altered so that the report would show specifically snow and ice accumulation and not modified depth.

The diagram below shows the sequence of events and interaction of EORS components when a user runs the Statewide Detail Report. To run a Statewide Detail Report the user navigates to the parameters page, enters the search parameters and submits the form. When the form is submitted EORS retrieves all data matching the search criteria and displays a printable report using Microsoft SQL Reporting Services.

Figure 3-30 Statewide Detail Report – SD

3.17 Add Ice to Shop Detail Report

Prior to WO52 Phase 2 the Shop Detail Report included modified depth for ice and snow precipitation. The Maryland State Highway Administration requested that the Shop Detail Report be altered so that the report would show specifically snow and ice accumulation and not modified depth.

The diagrams below shows the sequence of events and interaction of EORS components when a user runs the Shop Detail Report. To run a Shop Detail Report the user navigates to the parameters page, enters the search parameters and submits the form. When the form is submitted EORS retrieves all data matching the search criteria and displays a printable report using Microsoft SQL Reporting Services.

3.17.1 Latest Shop Detail Report
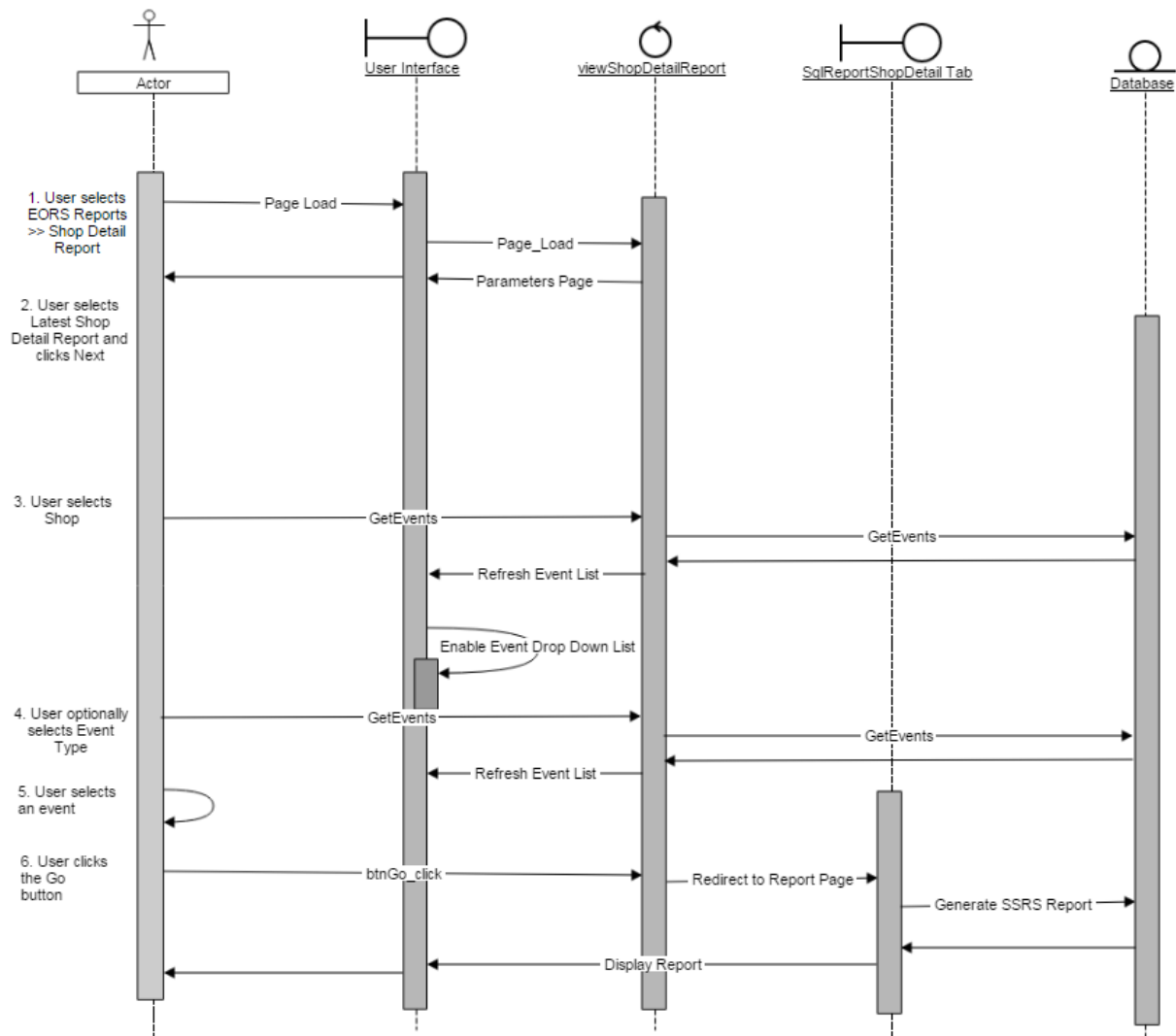
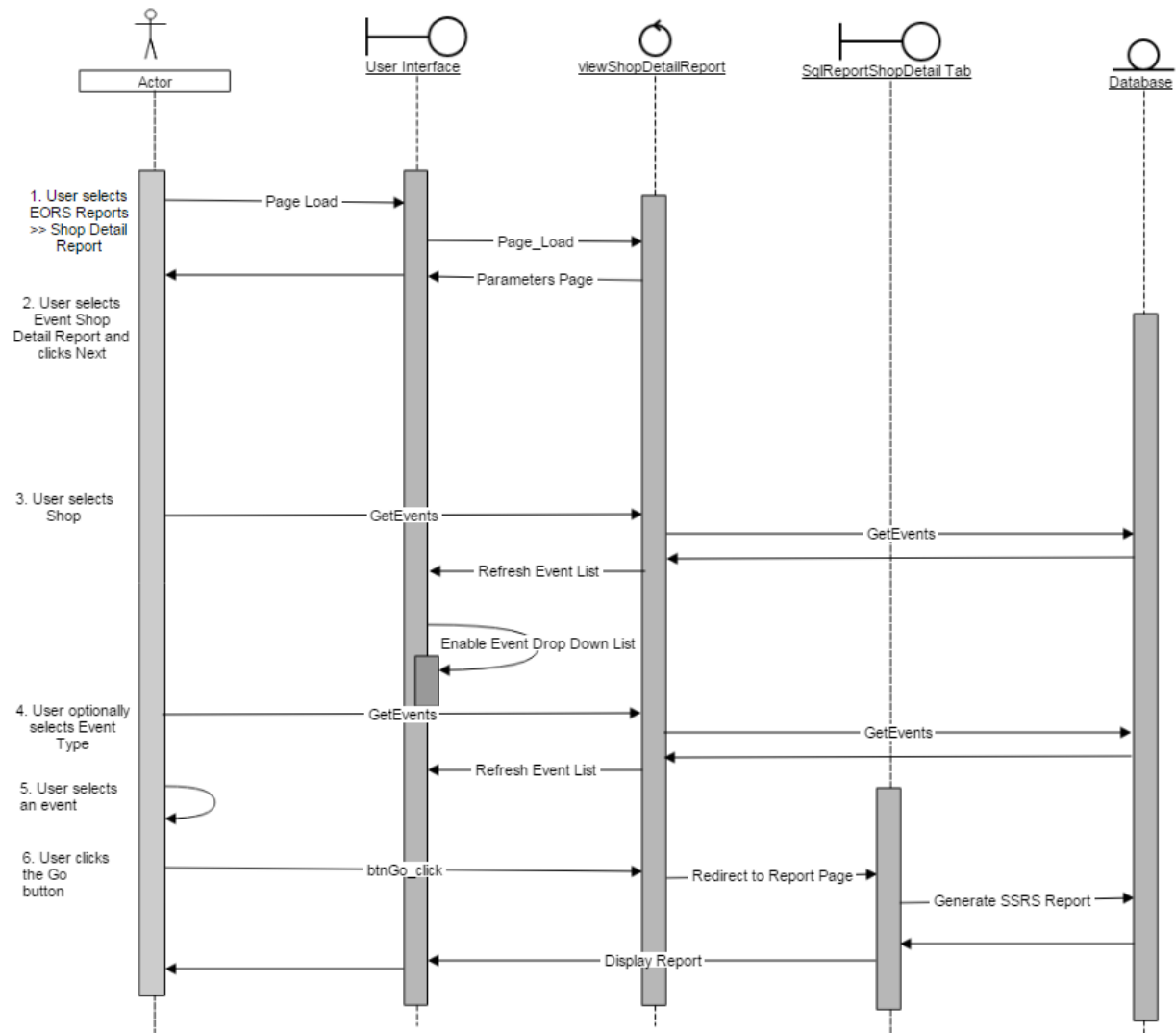**Figure 3-31 Latest Shop Detail Report – SD**

3.17.2 Event Shop Detail Report

Figure 3-32 Event Shop Detail Report – SD

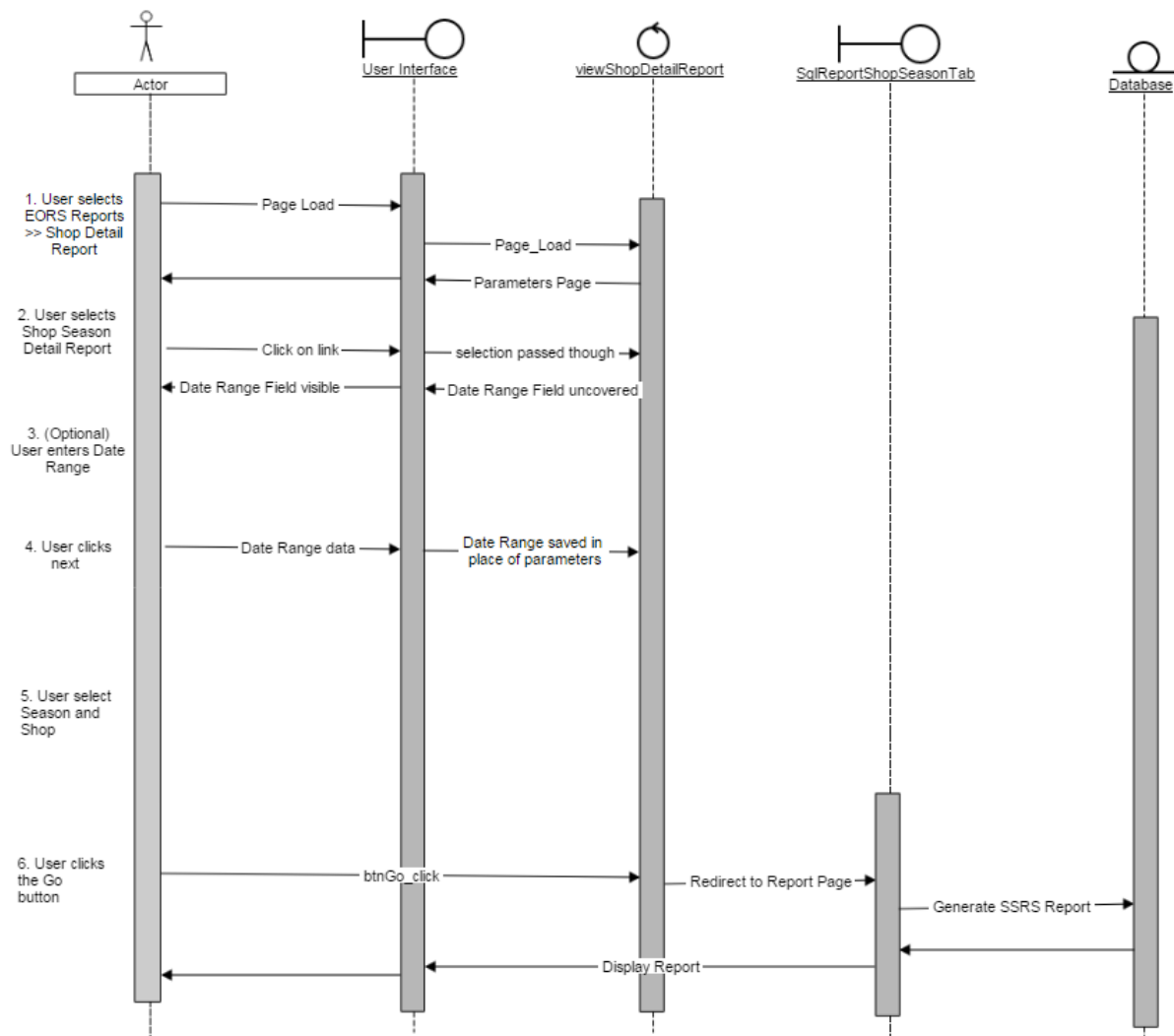### 3.17.3 Shop Season Detail Report

Figure 3-33 Shop Season Detail Report – SD
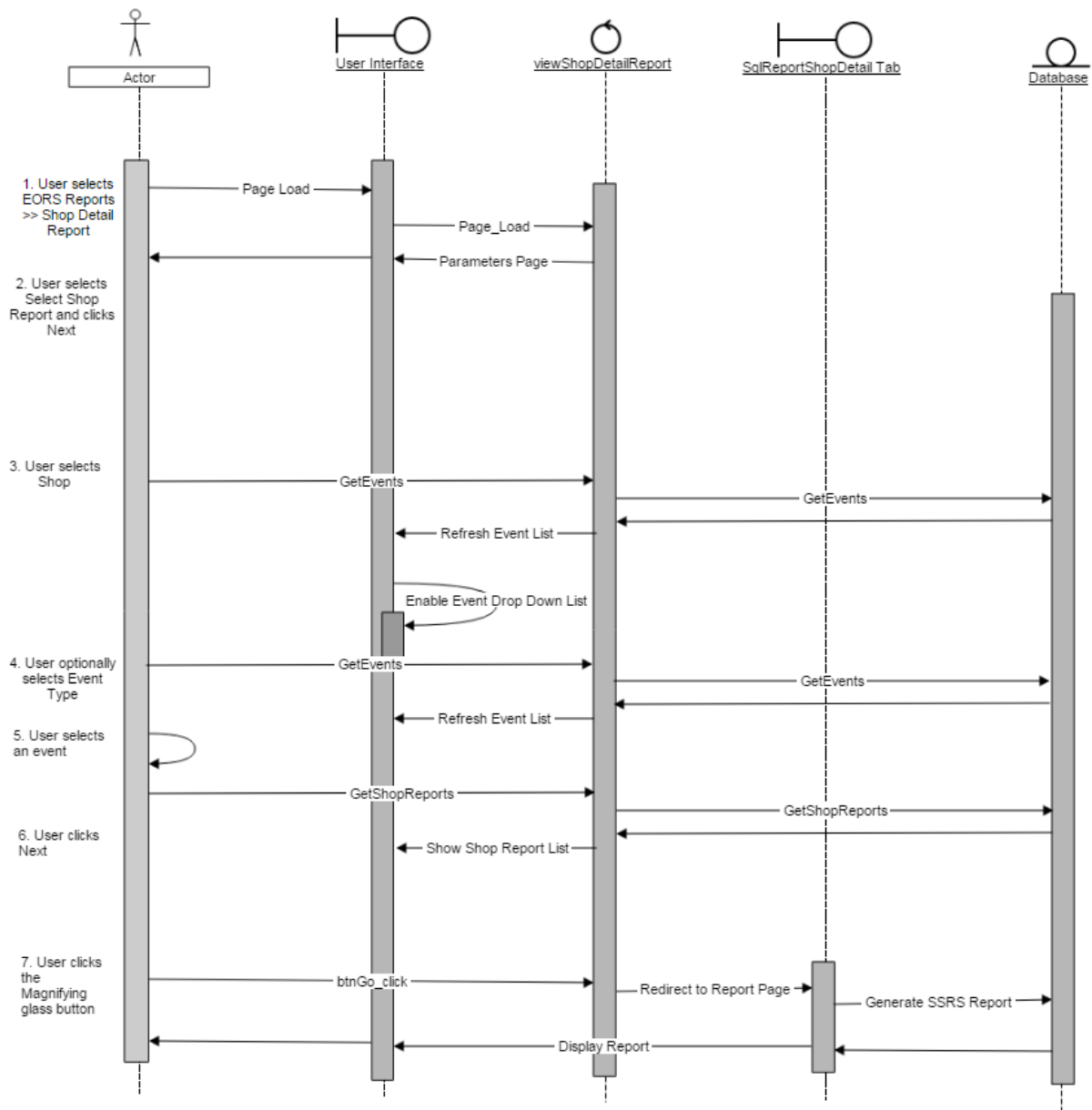
3.17.4 Select Shop Report

Figure 3-34 Select Shop Report – SD

3.18 Assumptions and Constraints

3.18.1 General

1. Assumption: Internet Explorer 9 and Internet Explorer 10 will be the browsers used to access EORS-V2.

2. Assumption: The user will have javascript enabled in their browser

3.18.2 web.config File

1. Assumption: Separate lockout times will be stored in the web.config file for shop reports, materials usage reporting and debris removal reporting.

2. Assumption: Lockout times will be integers representing the number of hours that an event is to remain unlocked after it is closed.

3. Assumption: Lockout times less than or equal to zero will be interpreted as never locking.

4 Human Machine Interface

4.1 EORS R6 Phase 2 GUI

This section describes the WO52 EORS Release 6 Phase 2 GUI.

4.1.1 Event Shop Reports Locking

The image below shows the result set of an event search in EORS that contains locked events. In this view multiple events are locked for shop reports and materials reporting. Those that are locked are flagged with the lock icon. Users may still follow the links as they would for an unlocked event. The final determination as to whether they may affect any changes will be deferred to the Event Shop Reports page.

Event ID	Event Type	Active	Created By	Date Created	Last Report	Event Name				
141101W001	Winter Storm	Closed	Stacey	11/01/2014 21:18	10/08/2015 15:06	First Snow	report	materials	edit	admin
141113W002 🔒	Winter Storm	Closed	cwillison	11/13/2014 16:11	11/14/2014 15:02	141113W002	report 🔒	materials 🔒	edit	admin
141116W003 🔒	Winter Storm	Closed	cwillison	11/16/2014 23:35	11/18/2014 12:00	141116W003	report 🔒	materials 🔒	edit	admin
141119W004 🔒	Winter Storm	Closed	Steve Hall	11/19/2014 16:32	11/21/2014 11:00	141119W004	report 🔒	materials 🔒	edit	admin
141125W005 🔒	Winter Storm	Closed	lschultz	11/25/2014 15:08	01/12/2015 11:39	Winter Event - 11/26/2014	report 🔒	materials 🔒	edit	admin
141127W006 🔒	Winter Storm	Closed	Steve Hall	11/27/2014 11:03	11/28/2014 19:49	141127W006	report 🔒	materials 🔒	edit	admin
141201W008 🔒	Winter Storm	Closed	CFetzer - OOM Deputy Director	12/01/2014 13:39	12/03/2014 11:07	Winter Event - 12/02/2014	report 🔒	materials 🔒	edit	admin
141204W009 🔒	Winter Storm	Closed	Steve Hall	12/04/2014 21:09	12/05/2014 19:55	141204W009	report 🔒	materials 🔒	edit	admin

Figure 4-1 Search Results

The image below shows the List of Shops Reporting page for a locked event. Each shop link in the list is flagged with a lock icon to show the user that the event is locked. Users may still click on any active link as they would for an unlocked event. The final determination as to whether they can affect any changes will be deferred to the Event Shop Reports page.

List of Shops Reporting

Event ID: 141208W010
Event Name: Winter Event - 12/08 - 12/09

Shop	Report Number	Operations Type	Report Date		
8225 - Elkton 🔒	4	Operations Complete	12/10/2014 5:51:09 AM	Latest Shop Detail Report	Shop Detail Report
8330 - Gaithersburg 🔒	9	Operations Complete	12/9/2014 10:53:07 AM	Latest Shop Detail Report	Shop Detail Report
8333 - Laurel 🔒	4	Operations Complete	12/9/2014 10:00:00 AM	Latest Shop Detail Report	Shop Detail Report
8334 - Marlboro 🔒	5	Operations Complete	12/9/2014 8:36:43 AM	Latest Shop Detail Report	Shop Detail Report
8441 - Churchville 🔒	8	Operations Complete	12/9/2014 11:40:49 AM	Latest Shop Detail Report	Shop Detail Report
8443 - Owings Mills 🔒	8	Operations Complete	12/9/2014 9:20:05 AM	Latest Shop Detail Report	Shop Detail Report
8444 - Hereford 🔒	8	Operations Complete	12/9/2014 9:30:00 AM	Latest Shop Detail Report	Shop Detail Report
8445 - Golden Ring 🔒	7	Operations Complete	12/9/2014 9:05:31 AM	Latest Shop Detail Report	Shop Detail Report
8662 - LaVale 🔒	12	Operations Complete	12/9/2014 5:34:19 PM	Latest Shop Detail Report	Shop Detail Report
8665 - Hagerstown 🔒	8	Operations Complete	12/9/2014 2:13:43 PM	Latest Shop Detail Report	Shop Detail Report

1 2

Figure 4-2 List of Shops Reporting

The image below shows the Events Shops Reports page for a locked event with the Operations Panel active. A message indicating that the event is locked is displayed at the top of the container. All input form fields are disabled except for the Shop Select List, the Search button and the Cancel button. This is the view that Event Shop Reports users see. OOM Admin, Site Admin and SOC users get the same view but the form fields are not disabled.

Event Shop Report

This event is locked. You can search and view reports for this event but only System and OOM administrators can make updates.

✱ Shop ID: Keysers Ridge ▾

| New Report | Save Report | Search Reports | Delete Report | Cancel |

Event Type: Winter Storm   Event Name: 141127W006
Event ID: 141127W006   Report #: 2

✱ Report Date: 11/27/2014 📅   ✱ Report Time: 14:59 ⊘
                                                   (Military Time 00:00 - 23:59)

| Operations | State | Contract | Redeployed | Roads | Weather | Requested Info | Search |

Operations

Ops Type   Emergency Operations ▾

Winter Emergency Storm Operations Activities (select all that apply)

☐ Plowing

☑ Applying Abrasives

☐ Applying Anti-Icing/De-Icing Chemical

☑ Applying Salt

☐ Pushing Back Shoulders

☐ Hauling Snow

Figure 4-3 Operations Panel

The image below shows Event Shop Reports page for a locked event with the State Panel active. Each input field on the State Panel is disabled. This is the view that Event Shop Reports users see. OOM Admin, Site Admin and SOC users get the same view but the form fields are not disabled.

Event Shop Report
This event is locked. You can search and view reports for this event but only System and OOM administrators can make updates.

✱ Shop ID: Keysers Ridge

| New Report | Save Report | Search Reports | Delete Report | Cancel |

Event Type: Winter Storm
Event ID: 141127W006
✱ Report Date: 11/27/2014

Event Name: 141127W006
Report #: 2
✱ Report Time: 14:59
(Military Time 00:00 - 23:59)

| Operations | State | Contract | Redeployed | Roads | Weather | Requested Info | Search |

State Resources - Winter Storm Event

✱ Personnel	28	Backhoes	0
Dump Trucks	13	Chippers	0
Loaders	4	Portable DMS	0
Pickups/SUVs	7	Light Towers	0
Graders	0	Bobcats	0
Wreckers	0	Skid Steers	0
Snow Blowers	0	Light Tow Trucks	0
Utility Trucks	0	Other	0

Figure 4-4 State Resources Panel

The image below shows Event Shop Reports page for a locked event with the Contract Panel active. Each input field on the Contract Panel is disabled. This is the view that Event Shop Reports users see. OOM Admin, Site Admin and SOC users get the same view but the form fields are not disabled.

Figure 4-5 Contract Resources Panel

The image below shows Event Shop Reports page for a locked event with the State Redeployed active. Each input field on the Redeployed Panel is disabled. This is the view that Event Shop Reports users see. OOM Admin, Site Admin and SOC users get the same view but the form fields are not disabled.

Figure 4-6 Redeployed Resources Panel

The image below shows Event Shop Reports page for a locked event with the Road Conditions Panel active. Each input field on the Road Conditions Panel is disabled. This is the view that Event Shop Reports users see. OOM Admin, Site Admin and SOC users get the same view but the form fields are not disabled.

Figure 4-7 Road Conditions Panel

The image below shows Event Shop Reports page for a locked event with the Weather Conditions Panel active. Each input field on the Weather Conditions Panel is disabled. This is the view that Event Shop Reports users see. OOM Admin, Site Admin and SOC users get the same view but the form fields are not disabled.

Figure 4-8 Weather Conditions Panel

The image below shows Event Shop Reports page for a locked event with the Comments/Requested Info Panel active. Each input field on the Comments/Requested Info Panel is disabled. This is the view that Event Shop Reports users see. OOM Admin, Site Admin and SOC users get the same view but the form fields are not disabled.

Figure 4-9 Comments/Requested Information Panel

The image below shows Event Shop Reports page for a locked event with the Search Panel active. All functionality on the Search Panel is available to all users who have access to it.

Figure 4-10 Search Shop Reports Page

4.1.2 Event Materials Locking

The images below show the locked materials page in EORS

Winter Event Materials

Figure 4-11 Winter Event Materials

NonWinter Event Materials

Figure 4-12 Non-Winter Event Materials

4.1.3 Event Debris Locking

The image below shows the locked debris page in EORS

Figure 4-13 Event Debris Removal Reporting

4.1.4 Add Ice to Event Shop Reports Weather Tab

The image below shows the changes to the Winter Event Shop Reports weather tab.

Figure 4-14 Add Ice to Winter Event Shop Reports Weather Tab

4.1.5 Salt Usage Report

The image below shows the updated Salt Usage Report. In addition to the modified depth column that was displayed in previous versions, snow depth and ice depth columns were added. Additionally, the snow, ice and modified depth columns will be aggregated in the district and statewide averages rows. Any calculations in the report that use snow/ice accumulations will use the modified depth.

Winter Material Usage And Snowfall Accumulations
2015-2016 Winter Season

Shop/District	Events With Accumulation	Snow Depth In Inches	Ice Depth In Inches	Modified Depth In Inches	Tons Of Salt Used	LBS Per Lane Mile	LBS Per Lane Mile Per Inch	Total Gallons Of Liquid Used	Total Gallons Of Liquid Used Per Ton Of Salt
8111-Cambridge (342.02 Lane Miles)	13.00	124.50	18.00	304.50	3,058.00	17,882.00	58.73	819.00	0.3
8112-Princess Anne (282.67 Lane Miles)	9.00	16.50	4.10	57.50	2,000.00	14,150.78	246.10	480.00	0.2
8113-Salisbury (537.45 Lane Miles)	4.00	8.00	2.00	28.00	1,000.00	3,721.28	132.90	240.00	0.2
8114-Snow Hill (631.17 Lane Miles)	4.00	8.00	2.00	28.00	1,000.00	3,168.72	113.17	240.00	0.2
District 1 Totals (1793.31 Lane Miles)					7,058.00			1,779.00	0.3
District 1 Average	7.50	39.25	6.53	104.50		7,871.48	75.33		

Shop/District	Events With Accumulation	Snow Depth In Inches	Ice Depth In Inches	Modified Depth In Inches	Tons Of Salt Used	LBS Per Lane Mile	LBS Per Lane Mile Per Inch	Total Gallons Of Liquid Used	Total Gallons Of Liquid Used Per Ton Of Salt
8221-Chestertown (358.23 Lane Miles)	8.00	16.00	4.00	56.00	2,000.00	11,166.01	199.39	480.00	0.2
8222-Centreville (568.53 Lane Miles)	8.00	16.00	4.00	56.00	2,000.00	7,035.69	125.64	480.00	0.2
8223-Denton (333.59 Lane	4.00	8.00	2.00	28.00	1,000.00	5,995.38	214.12	240.00	0.2

Figure 4-15 Salt Usage Report

4.1.6 Winter Operations Performance Report

The image below shows the updated Winter Operations Performance Report. In addition to the modified depth column there are snow depth and ice depth columns. Any calculations in the report that use snow/ice accumulation use the modified depth.

Winter Operations Performance Report for 7/1/2014-6/30/2015
150120W028

District	Shop	Season	Event Start Time	Operations complete Time	Event Duration (Hours)	Max Personnel	Max Contract Dump Trucks	Max State Dump Trucks	Min Pavement Temperature	Precipitation Begin	Precipitation End	Frozen Precipitation Duration (Hours)	Snow Accumulation	Ice Accumulation	Modified Depth	Restore Bare Pavement Time	Achieved Bare Pavement Ti
1	8111 Cambridge	2014-2015	1/21/2015 5:47:46 PM	1/22/2015 9:34:42 AM	15.78	22	0	13	32	1/21/2015 3:30:19 PM	1/21/2015 4:56:27 PM	1	0.00	0.00	0.00	1/21/2015 4:56:27 PM	00:00:00
1	8112 Princess Anne	2014-2015	1/22/2015 7:01:04 AM	1/22/2015 12:01:30 PM	5.01	8	0	4	31	1/22/2015 2:06:21 AM	1/22/2015 2:57:28 AM	0	0.20	0.00	0.20	1/22/2015 2:57:28 AM	00:00:00
1	8113 Salisbury	2014-2015	1/22/2015 8:24:23 AM	1/22/2015 12:06:35 PM	3.70	27	0	14	31	1/21/2015 6:19:21 PM	1/21/2015 8:33:47 PM	2	0.00	0.00	0.00	1/21/2015 8:33:47 PM	00:00:00
2	8221 Chestertown	2014-2015	1/21/2015 2:05:32 PM	1/22/2015 4:00:53 PM	25.92	28	3	13	29	1/21/2015 4:49:41 PM	1/21/2015 6:03:51 PM	1	3.00	0.00	3.00	1/21/2015 9:00:00 PM	02:56:09
2	8222 Centreville	2014-2015	1/21/2015 10:13:45 PM	1/22/2015 2:46:04 PM	16.54	41	17	18	29	1/21/2015 4:51:23 PM	1/21/2015 5:49:24 PM	0	2.50	0.00	2.50	1/21/2015 8:35:08 PM	02:45:44
2	8223 Denton	2014-2015	1/21/2015 11:10:40 AM	1/22/2015 7:24:55 AM	20.24	29	3	14	28	1/21/2015 4:49:03 PM	1/21/2015 5:48:00 PM	0	2.50	0.00	2.50	1/21/2015 9:08:21 PM	03:20:21
2	8224 Easton	2014-2015	1/21/2015 7:46:24 PM	1/22/2015 7:30:00 AM	11.73	25	0	15	32	1/21/2015 3:48:15 PM	1/21/2015 4:44:38 PM	0	1.75	0.00	1.75	1/21/2015 5:44:51 PM	01:00:13
2	8225 Elkton	2014-2015	1/21/2015 1:55:24 PM	1/22/2015 9:00:00 AM	19.08	40	11	22	28	1/21/2015 5:52:41 PM	1/21/2015 6:41:25 PM	0	1.00	0.00	1.00	1/21/2015 6:41:25 PM	00:00:00
3	8330 Gaithersburg	2014-2015	1/21/2015 8:00:00 PM	1/22/2015 8:00:00 AM	12.00	49	57	26	28	1/21/2015 4:27:06 PM	1/21/2015 5:17:27 PM	0	2.80	0.00	2.80	1/21/2015 5:17:27 PM	00:00:00
3	8332 Fairland	2014-2015	1/21/2015 11:29:33 AM	1/23/2015 1:35:50 AM	50.10	50	35	26	31	1/21/2015 4:03:51 PM	1/21/2015 5:03:14 PM	0	2.00	0.00	2.00	1/21/2015 5:03:14 PM	00:00:00
3	8333 Laurel	2014-2015	1/21/2015 11:28:36 AM	1/23/2015 1:29:08 AM	50.01	46	41	29	27	1/21/2015 3:11:48 PM	1/21/2015 4:11:42 PM	0	2.00	0.00	2.00	1/21/2015 4:11:42 PM	00:00:00
3	8334 Marlboro	2014-2015	1/21/2015 6:13:30 PM	1/23/2015 1:30:06 PM	43.28	44	46	25	32	1/21/2015 2:09:31 PM	1/21/2015 3:14:15 PM	1	1.00	0.00	1.00	1/21/2015 4:10:46 PM	00:56:31
4	8441	2014-2015	1/21/2015 11:10:03	1/22/2015 7:52:06 AM	20.70	41	53	21	28	1/21/2015 5:14:08 PM	1/21/2015 6:02:27 PM	0	2.00	0.00	2.00	1/21/2015 6:02:27 PM	00:00:00

Figure 4-16 Winter Operations Performance Report

4.1.7   Summarized List of Final Snow Accumulation Totals

The image below shows the changes to Summarized List of Final Snow Accumulation totals Report parameters page. The report will now be filterable by district, shop or a specific event.

Figure 4-17 Summarized List of Final Snow Accumulation totals Report Parameters Page

The image below shows the changes to the Summarized List of Final Snow Accumulation Totals Report.

Summarized List Of Final Snow Accumulation

7/1/2015 - 6/30/2016   Generated: 12/10/2015 10:20:25 AM

District: 1

shop	Event ID	Snow Accum	Ice Accum	Modified Depth	Date/Time Reported	Operations Type
Cambridge*	150220W040	100.50	12.00	220.50	11/6/2015 3:51:36 PM	Operations Paused
Cambridge*	151119W001	2.00	0.50	7.00	11/18/2015 5:00:00 PM	Operations Complete
Cambridge*	151119W002	2.00	0.50	7.00	11/19/2015 2:00:00 PM	Emergency Operations
Cambridge*	151119W003	2.00	0.50	7.00	11/18/2015 5:00:00 PM	Operations Complete
Cambridge*	151119W004	2.00	0.50	7.00	11/19/2015 2:00:00 PM	Emergency Operations
Cambridge*	151119W005	2.00	0.50	7.00	11/18/2015 5:00:00 PM	Operations Complete
Cambridge*	151119W006	2.00	0.50	7.00	11/19/2015 2:00:00 PM	Emergency Operations
		112.50	15.00	262.50		

shop	Event ID	Snow Accum	Ice Accum	Modified Depth	Date/Time Reported	Operations Type
Princess Anne*	150220W040	0.50	0.10	1.50	11/13/2015 2:22:02 PM	Pre-Event Operations
Princess Anne*	151119W003	2.00	0.50	7.00	11/18/2015 5:00:00 PM	Operations Complete
Princess Anne*	151119W004	2.00	0.50	7.00	11/19/2015 2:00:00 PM	Emergency Operations
Princess Anne*	151119W005	2.00	0.50	7.00	11/18/2015 5:00:00 PM	Operations Complete

Figure 4-18 Summarized List of Final Snow Accumulation Totals Report

4.1.8   Add Ice to Post Storm Review

4.1.9   Add Ice to Situational Awareness

District Summary

8111 - Cambridge

Report Date		Personnel		Equipment			Road Conditions					Temperatures				
Event		State	Redeployed	State	Redeployed	Hired	Interstate	Primary	Secondary	Operations Type	Weather	Air	Surface	Snow	Ice
151106W002	11/6/2015 3:28:09 PM	2	0	0	0	0	N/A	Wet	Wet	Emergency Operations	sleet, ice	22		10.03	1.05
Operations Notes															
Assist Other Agencies Notes															
Redeployed Resources Notes															
Comments/Requested Information															

4.1.10 Time to Restore Bare Pavement Report

The image below shows the changes to the Time to Restore Bare Pavement Report.

District	Shop Name	Season	EventID	Average Number of Events Per Shop	Start Time	End Time	Elapsed Time	Met Performance Measure for Event	Season to Date Percent Success	Season to Date Average Hours Needed to Achieve Bare Pavement	Snow Accumulation in Inches	Ice Accumulation in Inches	Modified Depth in Inches	Season to Date Average Per Event
1	Cambridge	2014-2015	150113W025		1/14/2015 11:25 AM	1/14/2015 11:25 AM	00:00:00	Yes	100.00	0.00	1.00	0.00	1.00	1.00
1	Cambridge	2014-2015	150120W028		1/21/2015 4:56 PM	1/21/2015 4:56 PM	00:00:00	Yes	100.00	0.00	0.00	0.00	0.00	0.50
1	Cambridge	2014-2015	150125W031		1/27/2015 6:16 AM	1/27/2015 6:16 AM	00:00:00	Yes	100.00	0.00	0.50	0.20	2.50	1.17
1	Cambridge	2014-2015	150209W035		2/10/2015 12:23 PM	2/10/2015 12:23 PM	00:00:00	Yes	100.00	0.00	0.00	0.09	0.90	1.10
1	Cambridge	2014-2015	150213W037		2/14/2015 9:15 PM	2/14/2015 9:15 PM	00:00:00	Yes	100.00	0.00	0.00	0.00	0.00	0.88
1	Cambridge	2014-2015	150216W038		2/17/2015 7:09 AM	2/17/2015 1:36 PM	06:26:49	No	83.33	1.07	9.00	0.00	9.00	2.23
1	Cambridge	2014-2015	150217W039		2/18/2015 10:19 PM	2/18/2015 10:19 PM	00:00:00	Yes	85.71	0.92	0.25	0.00	0.25	1.95
1	Princess Anne	2014-2015	150113W025		1/14/2015 7:52 AM	1/14/2015 11:33 AM	03:41:31	Yes	100.00	3.69	1.00	0.00	1.00	1.83
1	Princess Anne	2014-2015	150120W028		1/22/2015 2:57 AM	1/22/2015 2:57 AM	00:00:00	Yes	100.00	1.85	0.20	0.00	0.20	1.65
1	Princess Anne	2014-2015	150125W031		1/27/2015 7:09 AM	1/27/2015 7:09 AM	00:00:00	Yes	100.00	1.23	0.50	0.00	0.50	1.54
1	Princess Anne	2014-2015	150211W036		2/12/2015 4:02 PM	2/12/2015 4:02 PM	00:00:00	Yes	100.00	0.92	0.00	0.00	0.00	1.40
1	Princess Anne	2014-2015	150213W037		2/15/2015 2:30 AM	2/15/2015 2:30 AM	00:00:00	Yes	100.00	0.74	0.50	0.00	0.50	1.32
1	Princess Anne	2014-2015	150216W038		2/17/2015 8:11 AM	2/17/2015 1:30 PM	05:18:13	No	83.33	1.50	7.50	0.00	7.50	1.80
1	Princess Anne	2014-2015	150217W039		2/18/2015 11:04 PM	2/19/2015 1:01 AM	01:57:40	Yes	85.71	1.57	0.75	0.00	0.75	1.72
1	Salisbury	2014-2015	150113W025		1/14/2015 9:01 AM	1/14/2015 11:17 AM	02:16:10	Yes	100.00	2.27	0.50	0.00	0.50	1.64
1	Salisbury	2014-2015	150120W028		1/21/2015 8:33 PM	1/21/2015 8:33 PM	00:00:00	Yes	100.00	1.13	0.00	0.00	0.00	1.54
1	Salisbury	2014-2015	150125W031		1/27/2015 2:54 AM	1/27/2015 2:54 AM	00:00:00	Yes	100.00	0.76	0.00	0.18	1.75	1.55
1	Salisbury	2014-2015	150209W035		2/10/2015 2:21 PM	2/10/2015 2:21 PM	00:00:00	Yes	100.00	0.57	0.00	0.08	0.80	1.51
1	Salisbury	2014-2015	150213W037		2/14/2015 9:23 PM	2/14/2015 9:23 PM	00:00:00	Yes	100.00	0.45	0.25	0.00	0.25	1.44
1	Salisbury	2014-2015	150216W038		2/17/2015 9:24 AM	2/17/2015 2:11 PM	04:47:14	No	83.33	1.18	6.75	0.00	6.75	1.71
1	Salisbury	2014-2015	150217W039		2/18/2015 11:04 PM	2/19/2015 1:07 AM	02:03:14	Yes	85.71	1.30	0.25	0.00	0.25	1.64
1	Snow Hill	2014-2015	150105W021		1/6/2015 12:43 PM	1/6/2015 12:43 PM	00:00:00	Yes	100.00	0.00	0.00	0.00	0.00	1.56
1	Snow Hill	2014-2015	150113W025		1/14/2015 9:28 AM	1/14/2015 9:28 AM	00:00:00	Yes	100.00	0.00	0.75	0.00	0.75	1.53
1	Snow Hill	2014-2015	150125W031		1/27/2015 9:31 AM	1/27/2015 9:31 AM	00:00:00	Yes	100.00	0.00	0.25	0.00	0.25	1.48

Time To Restore Bare Pavement

Figure 4-19 Time to Restore Bare Pavement Report

4.1.11 Winter Event Statistics Report

The image below shows the changes to the winter Event Statistics Report.

Maintenance Office/District	Number of Winter Events w/ Frozen Precipitation	Total Snow Accumulation	Total Ice Accumulation	Total Modified Depth	* Number of Winter Events w/0 Frozen Precipitation
8111-Cambridge	6	11	0.29	13.9	4
8112-Princess Anne	6	10.45	0	10.45	3
8113-Salisbury	6	7.75	0.255	10.3	4
8114-Snow Hill	6	9.45	0	9.45	4
District 1 Average	**6.00**	**9.66**	**0.14**	**11.03**	**3.75**
8221-Chestertown	9	17.85	0.39	21.75	6
8222-Centreville	11	15.66	0.599	21.65	2
8223-Denton	12	21.8	0.54	27.2	2
8224-Easton	11	19.7	0.35	23.2	3
8225-Elkton	13	23.1	0.75	30.6	5
District 2 Average	**11.20**	**19.62**	**0.53**	**24.88**	**3.60**
8330-Gaithersburg	11	29.92	0.325	33.17	6
8332-Fairland	10	22.75	0.145	24.2	6
8333-Laurel	10	22.25	0.3	25.25	6
8334-Marlboro	12	21.15	0.095	22.1	5
District 3 Average	**10.75**	**24.02**	**0.22**	**26.18**	**5.75**
8441-Churchville	11	24	0.71	31.1	9

2014-2015 Winter Event Statistics

Figure 4-20 Winter Event Statistics Report

4.1.12 Maximum Precipitation Report

The image below shows the changes to the Maximum Precipitation Report parameters page. The report may now be filtered by district and/or event.

Figure 4-21 Maximum Precipitation Report Parameters Page

4.1.13 Add Ice to District Summary Report

The image below shows the changes to the District Summary Report:

Shop	Personnel State	Equipment State	Equipment Hired	Inter	Road Conditions Prim	Road Conditions Sec	Op. Type	Weather	Temperature Air	Temperature SFC	Snow	Ice/Freezing Rain
8221 Chestertown Jan 13 2015 7:25AM	0	0	0	N/A	Wet	Wet	Operations Complete	rain, fog	38	31	0.00	0.10
8222 Centreville Jan 13 2015 10:00AM	0	0	0	N/A	Dry	Dry	Operations Complete	cloudy	31	38	0.01	0.10
8223 Denton Jan 13 2015 9:26AM	0	0	0	N/A	Wet	Wet	Operations Complete	cloudy	33	33	0.10	0.09
8224 Easton Jan 12 2015 3:47PM	0	0	0	N/A	Wet	Wet	Operations Complete	rain	39	37	0.00	0.03
8225 Elkton Jan 13 2015 8:48AM	0	0	0	N/A	Wet	Wet	Operations Complete	rain	37	27	0.00	0.25
Totals	0	0	0									

4.1.14 Add Ice to Statewide Summary Report

The image below shows the changes to the Statewide Summary Report:

District	Shop	Personnel State	Equipment State	Equipment Hired	RoadConditions Inter	Prim	Sec	Op. Type	Weather	Air	SFC	Snow	Ice/Freezing Rain
District 1 Totals		0	0	0									
								Generated: 12/1/2015 9:16:08 AM		Temperature			
2													
	8221 Chestertown Jan 13 2015 7:25AM	0	0	0	N/A	Wet	Wet	Operations Complete	rain, fog	38	31	0.00	0.10
	8222 Centreville Jan 13 2015 10:00AM	0	0	0	N/A	Dry	Dry	Operations Complete	cloudy	31	38	0.01	0.10
	8223 Denton Jan 13 2015 9:26AM	0	0	0	N/A	Wet	Wet	Operations Complete	cloudy	33	33	0.10	0.09
	8224 Easton Jan 12 2015 3:47PM	0	0	0	N/A	Wet	Wet	Operations Complete	rain	39	37	0.00	0.03
	8225 Elkton Jan 13 2015 8:48AM	0	0	0	N/A	Wet	Wet	Operations Complete	rain	37	27	0.00	0.25

4.1.15 Add Ice to Statewide Detail Report

The image below shows the changes to the Statewide Detail Report:

District	Shop	Personnel State	Personnel Redep	Equipment State	Equipment Redep	Hired	RoadConditions Inter	Prim	Sec	Op. Type	Weather	Air	SFC	Snow	Ice/Freezing Rain
	Emergency Operations & Road Conditions									Generated: 12/1/2015 9:27:41 AM		Temperature			
2															
	8221 Chestertown Jan 13 2015 7:25AM	0	0	0	0	0	N/A	Wet	Wet	Operations Complete	rain, fog	38	31	0.00	0.10
	8222 Centreville Jan 13 2015 10:00AM	0	0	0	0	0	N/A	Dry	Dry	Operations Complete	cloudy	31	38	0.01	0.10
	8223 Denton Jan 13 2015 9:26AM	0	0	0	0	0	N/A	Wet	Wet	Operations Complete	cloudy	33	33	0.10	0.09
	8224 Easton Jan 12 2015 3:47PM	0	0	0	0	0	N/A	Wet	Wet	Operations Complete	rain	39	37	0.00	0.03
	8225 Elkton Jan 13 2015 8:48AM	0	0	0	0	0	N/A	Wet	Wet	Operations Complete	rain	37	27	0.00	0.25
District 2 Totals		0	0	0	0	0									

4.1.16 Add Ice to Shop Detail Report

4.1.16.1 Latest/Select Shop Detail Report

SQL Reporting Services

Shop Detail Report

| ◄◄ ◄ 1 of 1 ► ►| ◄ [   ] Find | Next 🖫 ▾ 🔄 |

Portable DMS: 0   Snow Blowers: 0   Backhoes: 0
Light Towers: 0   Wreckers: 0
Others: 0   Bobcats: 0
                                      Utility Trucks: 0
                                      Others: 0

General Road Conditions:

Inter State: N/A

Primary: Wet

Secondary: Wet

Weather Information   **Comments/Requested Information**

Type: rain, fog   No Comments were Entered for this report

Temperature: 38

Surface Temperature: 31

Snow Depth: 0.00

Ice Depth: 0.10

4.1.16.2 Event Shop Detail Report

SQL Reporting Services

EventShopDetailReport

| ◄◄ ◄ 9 of 10 ► ►| ◄ [   ] Find | Next 🖫 ▾ 🔄 |

Excavators: 0   Portable DMS: 0   Bobcats: 0

Bobcats: 0   Light Towers: 0   Supervisor Vehicles: 0

                 Snow Blowers: 0   Snow Blowers: 0

Other: 0

General Road Contitions

Interstate: N/A

Primary: Dry

Secondary: Dry

Weather Information   **Comments/Requester Information**

Type: Cloudy   Full Shop
Temperature: 31   Road temp 27
Sfc Temperature: 38   Post Op
Snow Depth: 0.01   Roads Dry & clean up
Ice Depth: 0.10

4.1.16.3 Season Shop Detail Report

SQL Reporting Services

Shop Season Detail Report

|◀ ◀ 294 of 294 ▶ ▶| ⟵ [_____] Find | Next 🖫 ▾ ⟳

PU/Auto: 1   Skid steers: 0   PU/Auto: 0
Chippers: 0   Backhoes: 0   Chippers: 0
Portable DMS: 0   Snow Blowers: 0   Backhoes: 0
Light Towers: 0   Wreckers: 0
Others: 0   Bobcats: 0
                                            Utility Trucks: 0
                                            Snow Supervisor Vehicles: 0

General Road Conditions: **comments/Requested Information:**

Inter State: N/A
Primary: Wet   Winds 5mph SE
Secondary: Wet
                                      Skelton Crew staying at 4pm
Weather Information

Type: rain
Temperature: 35
Surface Temperature: 38
Snow Depth: 0.75
Ice Depth: 0.00

5 Requirement Verification Traceability Matrix

Use Case	Design Elements
UC-1.0 Event Locking	• Events Class Diagram – CD • Event Shop Reports Class Diagram – CD • Search Events – SD • Event Admin – SD • List of Shops Reporting – SD • Event Shop Reports (Admin/OOM Users) – SD • Event Shop Reports (EventShopReports/Shop/District) – SD • Event Materials Reporting (Admin/OOM Users) – SD • Event Materials Reporting (EventShopReports/Shop/District Users) – SD • Event Debris Removal Reporting (Admin/OOM Users) – SD • Event Debris Removal Reporting (EventShopReports/Shop/District Users) – SD
UC-1.1 Search Events – UC	• Events Class Diagram – CD • Search Events – SD
UC-1.2 Event Admin – UC	• Events Class Diagram – CD • Event Admin – SD
UC-1.3 List of Shops Reporting – UC	• Events Class Diagram – CD • List of Shops Reporting – SD
UC-1.4 Event Locking – Event Shop Reports (Admin/ OOM user) – UC	• Event Shop Reports Class Diagram – CD • Event Shop Reports (Admin/OOM Users) – SD
UC-1.5 Event Locking – Event Shop Reports (EditShopReports/Shop/District user) – UC	• Event Shop Reports Class Diagram – CD • Event Shop Reports (EventShopReports/Shop/District

	Users) – SD
UC-1.6 Event Locking – Materials (Admin/OOM user) – UC	• Events Class Diagram – CD • Event Materials Reporting (Admin/OOM Users) – SD
UC-1.7 Event Locking – Materials (EventShopReports/Shop/District user) – UC	• Events Class Diagram – CD • Event Materials Reporting (EventShopReports/Shop/District Users) – SD
UC-1.8 Event Locking – Debris (Admin/OOM user) – UC	• Events Class Diagram – CD • Event Debris Removal Reporting (Admin/OOM Users) – SD
UC-1.9 Event Locking – Debris (EventShopReports/Shop/District user) – UC	• Events Class Diagram – CD • Event Debris Removal Reporting (EventShopReports/Shop/District Users) – SD
UC-2.0 Add Ice to Event Shop Reports Weather Tab	• Events Class Diagram – CD • Event Shop Reports Class Diagram – CD • Event Shop Reports Weather Tab – CD • Add Ice to Event Shop Reports Weather Tab - SD
UC-2.1 Add Ice to Event Shop Reports Weather Tab - UC	• Events Class Diagram – CD • Event Shop Reports Class Diagram – CD • Event Shop Reports Weather Tab – CD • Add Ice to Event Shop Reports Weather Tab - SD
UC-3.0 Salt Usage Report	• Salt Usage Report Class Diagram – CD • Salt Usage Report Sequence Diagram – SD • Salt Usage Report Parameters Page Season/Date Range Interaction – SqD • Salt Usage Report Parameters Page Drill Down – SqD • Salt Usage Report Parameters Page Event – SqD
UC-3.1 Salt Usage Report – UC	• Salt Usage Report Class Diagram – CD

	• Salt Usage Report Sequence Diagram – SD
	• Salt Usage Report Parameters Page Season/Date Range Interaction – SqD
	• Salt Usage Report Parameters Page Drill Down – SqD
	• Salt Usage Report Parameters Page Event – SqD
UC-4.0 Winter Operations Performance Report	• Winter Operations Performance Report – CD
	• Winter Operations Performance Report Sequence Diagram – SD
	• Winter Operations Performance Report Parameters Page Season/Date Range Interaction – SqD
	• Winter Ops Performance Report Parameters Page Event Drill Down – SqD
	• Winter Operations Performance Report Parameters Page Drill Down Type – SqD
UC-4.1 Winter Operations Performance Report – UC	• Winter Operations Performance Report – CD
	• Winter Operations Performance Report Sequence Diagram – SD
	• Winter Operations Performance Report Parameters Page Season/Date Range Interaction – SqD
	• Winter Ops Performance Report Parameters Page Event Drill Down – SqD
	• Winter Operations Performance Report Parameters Page Drill Down Type – SqD
UC-5.0 Summarized List of Final Snow Accumulation Totals	• Summarized List of Final Snow Accumulation Totals Class Diagram – CD
	• Summarized List of Final Snow Accumulation Totals – SD
UC-5.1 Summarized List of Final Snow	• Summarized List of Final Snow

Accumulation Totals Parameters Page – UC	Accumulation Totals Class Diagram – CD • Summarized List of Final Snow Accumulation Totals – SD
UC-5.2 Summarized List of Final Snow Accumulation Totals Report - UC	• Summarized List of Final Snow Accumulation Totals Class Diagram – CD • Summarized List of Final Snow Accumulation Totals – SD
UC-6.0 Add Ice to Post Storm Review	•
UC-6.1 Add Ice to Post Storm Review – UC	•
UC-7.0 Add Ice to Situational Awareness	•
UC-7.1 Run Situational Awareness – UC	•
UC-8.0 Time to Restore Bare Pavement Report	• Time to Restore Bare Pavement Report Class Diagram – CD • Time to Restore Bare Pavement Report – SD
UC-8.1 Time to Restore Bare Pavement Report – UC	• Time to Restore Bare Pavement Report Class Diagram – CD • Time to Restore Bare Pavement Report – SD
UC-9.0 Winter Event Statistics Report	• Winter Event Statistics Report Class Diagram – CD • Winter Event Statistics Report – SD
UC-9.1 Winter Event Statistics Report – UC	• Winter Event Statistics Report Class Diagram – CD • Winter Event Statistics Report – SD
UC-10.0 Maximum Precipitation Report	• Maximum Precipitation Report Class Diagram – CD • Maximum Precipitation Report – SD
UC-10.1 Maximum Precipitation Report (Season or Date Range) – UC	• Maximum Precipitation Report Class Diagram – CD • Maximum Precipitation Report – SD
UC-10.2 Maximum Precipitation Report (Season or Date Range & Event ID) – UC	• Maximum Precipitation Report Class Diagram – CD • Maximum Precipitation Report – SD

UC-10.3 Maximum Precipitation Report (Season or Date Range & District) – UC	• Maximum Precipitation Report Class Diagram – CD • Maximum Precipitation Report – SD
UC-10.4 Maximum Precipitation Report (Season or Date Range, District & Event ID) – UC	• Maximum Precipitation Report Class Diagram – CD • Maximum Precipitation Report – SD
UC-11.0 Add Ice to District Summary Report	•
UC-11.1 Run District Summary Report – UC	•
UC-12.0 Add Ice to Statewide Summary Report	•
UC-12.1 Run Statewide Summary Report – UC	•
UC-13.0 Add Ice to Statewide Detail Report	•
UC-13.1 Run Statewide Detail Report – UC	•
UC-14.0 Add Ice to Shop Detail Report	•
UC-14.1 Run Shop Detail Report (Latest Shop Detail Report) – UC	•
UC-14.2 Run Shop Detail Report (Event Shop Detail Report) – UC	•
UC-14.3 Run Shop Detail Report (Shop Season Detail Report) – UC	•
UC-14.4 Run Shop Detail Report (Select Shop Report) – UC	•